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STEEL

For forty eight years — IRON TRADE REVIEW

October 9, 1930

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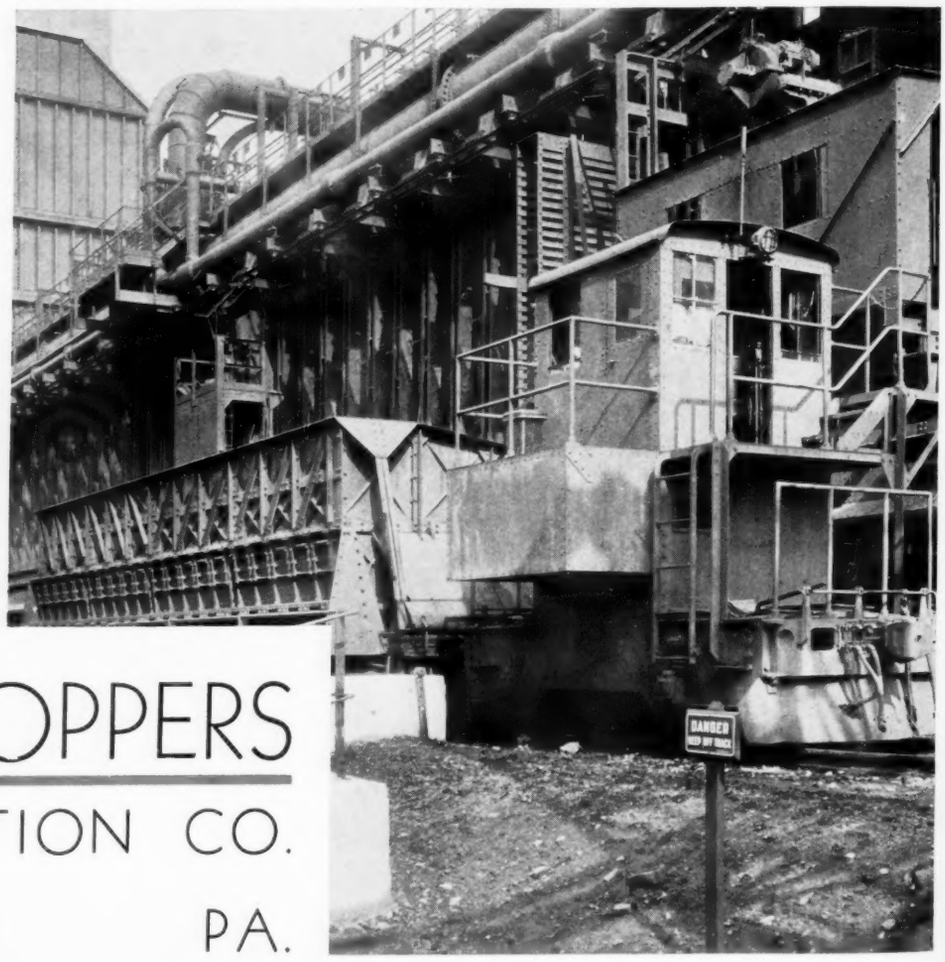

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PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

Use X-ray Machine in Examining Welds in 2½-inch Steel Plate. Page 62.

THIS WEEK:

ALTHOUGH industrial accidents continue to decline in number, the severity is increasing. This fact was revealed to safety engineers attending the annual congress of the National Safety council last week. The report of the congress on pages 24 and 61 of this issue points out that the frequency rate in the steel industry has been declining since 1927, being 19 per cent less in 1929, but the severity rate was 32 per cent higher. The increase results from a rise in fatal and permanent injuries.

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You Never Can Tell Where Lightning Will Strike

Joseph T. Ryerson, who founded this business in 1842 adhered strictly to a policy of concentrating his purchases with those who not only had the desire but also the ability to take care of him in an emergency. To this fact alone he attributed the life of this organization on at least two occasions* many years ago.

There is little doubt but that an under market price may be secured occasionally by shopping around. A few dollars may be saved . . . a chance taken on quality and delivery. But that is only half the picture.

No one knows when a general condition or some business influence; some invention or new situation in the industry may bring embarrassment. We all expect good business and continued success. But at best, even when the horizon is clear, it pays to buy from a strong dependable House that can cooperate with you when necessary.

*The Chicago Fire. Panic of 1857.

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STEEL-SERVICE

Volume 87 Number 15

STEEL

For forty-eight years—IRON TRADE REVIEW

PRODUCTION ◆ PROCESSING ◆ DISTRIBUTION ◆ USE

This Week in Steel

STEEL, attempting to be brave in the face of adverse, exterior business influences, has been cruelly betrayed in its own house. During September demand for steel rose mildly and prices stiffened, buoying sentiment. Now, steel suffers a triple shock—a 7.6 per cent decline in ingot production last month (Page 30), a loss of 6.8 per cent in pig iron (Page 31), and complete dissipation of momentum in buying (Page 83). . . . It is inevitable that some of the improved sentiment of the industry will be vitiated, nevertheless steel, like most other industries, desires to think constructively. It is just a year since stocks toppled from their dizzy peaks and plunged business into declining values, production, employment and morale, and business has become sated with pessimism. There may not be much good news over the remainder of the year but there is a widespread conviction that the worst is past. . . . Doubtless it was apprehension of this that prompted even the opposition newspapers to acclaim President Hoover's unequivocal stand against any lowering of living standards, at Cleveland last week. . . . Any retreat in living standards would, of course, involve permanently reduced commodity prices. Wheat, sugar, rubber, cotton—almost every commodity except steel—have declined to 1914 price levels or lower, causing doubt whether they would recover. A foremost economist of the department of agriculture maintains that they will (Page 23) and singles out credit as the major factor governing the recovery.

Steel Stockholders Are Confident

At least 135,504 persons are confident of the future of steel. At the end of September there were this many stockholders of United States Steel, 5878 more than at any previous period in this giant's history (Page 27). . . . Henry Ford has done enough experimenting with the disassembly of automobile derelicts to warrant ordering a 400-ton tilting open-hearth steel furnace, probably the largest in the country (Page 31). Charging the cadaver of a stripped car, crushed to the proportions of a mattress, will offer no obstacle with doors commensurate. . . . National Association of Manufacturers, in annual convention at New York, discloses a trade survey of the steel and iron industry showing 55 per cent of all companies responding to its questionnaire expecting business the remainder of the year to be fair (Page 93).

Manganese Leads March on Russia

Common cause makes strange company. Manganese, glue, sausage casings, lumber,

Wide World Photo

Steel interests contributed liberally to Pittsburgh's "Cathedral of Learning", a 42-story building nearing completion for the University of Pittsburgh. About 15,000 tons of steel was required for this unusual type of university building. More than $4,000,000 of the $10,000,000 cost is represented in construction of laboratories.

wheat are represented on a committee being organized to weld together opposition to imports from Soviet Russia (Page 31). Domestic manganese producers, who will be recalled as asking an anti-dumping order from the treasury, sponsor the movement. . . . Russia, as its activity in exports denotes, is attempting to work. Organized labor in the United States, strongly antagonistic to anything "red," is considering demanding a 5-hour day, 5-day work week (Page 25).

60 Billions for Homes in 20 Years

Despite the present relapse, the potential market for steel gathers momentum. Only last week the committee on home planning set up by the department of commerce informed Secretary Lamont that in the next twenty years 50 billion dollars will be expended for home construction (Page 25). Realizing that two decades are a long time, the committee provided more immediate encouragement in the forecast that over this period one half billion dollars annually will be spent for home repairs. Of this 60 billions, no small portion should go for pipe, cellar supports etc. . . . Who would have thought there is a billion dollar market for electric clocks? A manufacturer of clocks has concluded an alliance with a large electrical interest to put electric clocks on a real production basis. Nineteen million homes are wired for electricity, requiring four clocks per home. The possibilities for sheets and strip in 76,000,000 clocks should make sales managers sharpen their pencils.

Executive Sets Pace with Steel Barn

If homes of steel, why not barns? The blue-blooded cows of a vice president of an eastern steel company will shortly chew their cuds in a structure (Page 25) into which went 133 tons of structurals. The columns are 48 feet high, and to set the top purlins an 80-foot boom was required. . . . Nine plaques, awarded at last week's congress in Pittsburgh of the National Safety council, set apart as many plants as winners in the council's metal-section contest (Page 24). Safety work apparently has checked the number of industrial accidents but the severity rate of injuries is on the increase. . . . Shippers' Regional Advisory boards have put in their forecasts for freight car requirements for the fourth quarter (Page 26) and the returns show a decline of 7.3 per cent from a year ago. For iron and steel the drop is only 5.8 per cent; for automobiles 22 per cent.

Good Salesman Not a «Talkie»

Were you ever bothered by a salesman who talked too much or who interrupted you every time you tried to mention an objection which you held to buying his product? Then he was not acquainted with the six cardinal principles of selling described to an enthusiastic audience of salesmen during one session of the National Metal congress in Chicago recently (Page 52). As the technical data presented in the 98 papers read before the congress are boiled down, some interesting observations as to subject matter are possible. For instance, a group of papers dealt with that important subject, physical testing of steels (Page 50). . . . Attendance at the movies has ceased to be entertainment for workers in some plants who are being taught manufacturing operations by the movie method where verbal or printed instructions fail to produce the desired results. A manufacturer of cameras, expanding foreign facilities, recently sent along a few reels of film to the foreign erectors, depicting methods of tooling and operating various machines. An interesting series of stamping, washing, heat treating, carburizing and painting operations has been developed for production of camera parts (Page 47).

Rust Finally Put to Some Use

Rust long has been a source of worry to the steelmaker and great pains are taken to remove it from the surface of the metal before shipment from the mill. However, to the welder engaged in joining steel joists by the electric resistance method (Page 72), a slight coating of oxidation is essential to promote the localization of heat at the point of contact. . . . The austenitic or nonmagnetic structure in steels, a structure which characterizes the 18-8 and other corrosion-resisting alloys, is found to be stabilized by the addition of manganese, although the austenite is induced primarily by carbon (Page 68).

Gas Producer Practice Is Improved

Higher efficiency and economy in the operation of gas producers has a direct bearing on the time required to melt open-hearth charges and the tonnage of semifinished steel served to the finishing rolls. Recording instruments simplify gas producer practice (Page 54) and place it on a more scientific basis. . . . X-ray examination is one of the latest methods to be used on a production basis for the exploration of seams in the welded pressure vessel (Page 62). Industry soon may be using higher steam pressures, for at present steel plate 2½ inches thick cannot halt the penetrating power of the X-ray and thus conceal unsound joints. . . . Mechanical forces encountered in the rolling of steel emphasize the importance associated with the design of heavy-duty antifriction bearings. Still another problem in the production of finished steel is the cutting of the material to length. As existing operating data (Page 67) are evaluated, many of the variables disappear.

Commodity Prices To Come Back, with Credit a Factor

COMMODITY prices, on the toboggan since the summer of 1929 until at present many are at the lowest point in a decade or even longer, will recover. How far the level of prices will advance after the downward trend has been reversed depends upon the credit situation.

So declares Norman J. Wall, senior agricultural economist, department of agriculture, Washington, in *Trade Winds*, a publication of the Union Trust Co., Cleveland. He takes issue with some economists who liken the present period to that of 1814-60, when commodity prices fell. Mr. Wall believes, in brief:

Prices on wheat, sugar, copper and rubber, which with others have been in such a decline, will be closely tied in with the future of the credit supply. Money rates in all important money markets of the world now are extremely low, both call and time rates being far beneath the percentages quoted of the corresponding period of 1929. Credit is plentiful and cheap.

There is nothing in existing facts to warrant the assumption that the credit supply of the next few years will be inadequate to finance production and distribution at not only the present price level but at even a higher level. Likewise, low money rates here stimulate foreign lending, the proceeds of which increase alien purchases in the United States. Export demand naturally results in a higher activity here, with favorable effect on prices.

Bound up as it is with gold, further credit extension can look assuringly to policy of leading nations of reaccumulation of gold supplies. United States, having a large gold surplus now, can lend this to support an increasing volume of credit as business again resumes its upward march.

Tied in with the credit situation to determine whether business will resume its normal upward course is the second major factor—the condition of existing stocks of finished goods in the hands of manufacturers, distributors and retailers.

As prices decline, distributors and retailers pursue a conservative stock policy in order to reduce inventory losses. For a period, therefore, consumers are supplied from existing stocks. But, for some time now consumption has been at a high rate relative to production. More and more are inventories becoming depleted.

Then the distributor must turn to the producer and ask for commodities. And when this comes, plants operated at an increased rate, the incentive to grant price concessions in order to maintain a volume of business is less pressing. The price structure therefore begins to show signs of firmness.

New Electric Clock To Tap Billion Dollar Market

A revival of the clock business, which sponsors expect to develop into a billion dollar market, is forecast by announcement of R. H. Whitehead, president, New Haven Clock Co., New Haven, Conn., that his company has arranged with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., whereby both will offer the public a new electric clock.

Nineteen million homes in the United States are wired for electricity, and with an average of four clocks to the home, according to Mr. Whitehead's announcement "this represents a rapidly growing market of more than 75,000,000 clocks, at an average resale value of $10." The newest of the electrical family is expected to rival that young giant, the radio. There has been no interchange of stock or interlocking of directorates.

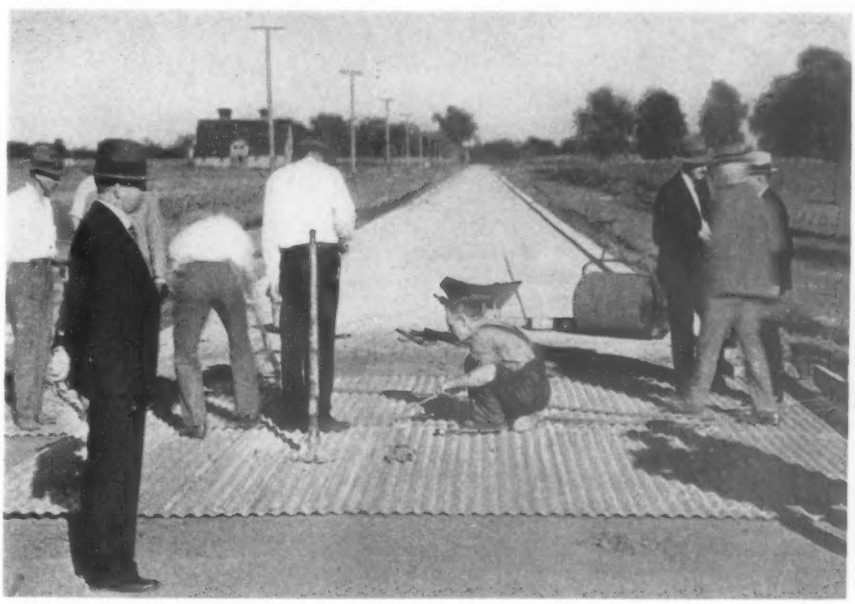
Several types of clocks will be marketed at first, but the type expected to get the public's attention is described as a sub-synchronous, self-starting motor alarm clock, whose accuracy is controlled by the impulses of alternating current from the central station.

Page Tariff Vice Chairman

Thomas Walker Page, Democrat, of Virginia, with past experience on tariff commissions under three presidents and recently appointed by President Hoover to the new tariff board, has been appointed vice chairman of that body. Henry P. Fletcher is chairman of the tariff commission. Announcement was also made that Leland Harrison had been named chief of the international relations division.

Weirton Completing Mill

Structural and rail mill now under construction at the Weirton, W. Va., plant of Weirton Steel Co., a unit of National Steel Corp., is nearing completion and will go into operation by Dec. 1. Completion of this mill will further diversify the operations of the Weirton plant.



LARGE STEEL TONNAGE—IF THIS IS SUCCESSFUL

An experimental section of a highway using a metal base was laid recently in Springfield, Ill. In one 50-foot stretch the corrugations in galvanized sheets run lengthwise of the road, in another 50 feet they run transversely, and in a third, blue annealed sheets are used. A mastic sand cushion was laid over the sheets and on this the brick pavement. The illustration shows spot welding the corrugated sheets to hold them in place. The American Rolling Mill Co., Middletown, O., National Paving Brick Manufacturers' association, and Springfield highway officials co-operated

Safety Engineers Lay Plans for Accident Prevention

SAFETY engineers representing many industries, meeting in Pittsburgh, Sept. 29-Oct. 3, for the nineteenth annual safety congress of the National Safety council, were told that the number of industrial accidents continued to decline last year, but that the severity rate of injuries is still on the increase. This trend also is evident in the metal industries.

Between 5000 and 6000 registered for the congress and the total attendance was 10,000. In addition to listening to over 350 papers on safety subjects, the delegates considered the record of the past year and laid plans for future work in accident prevention. More than 70 manufacturers of safety equipment participated in the exposition conducted in the William Penn hotel, while other companies and state and federal departments occupied outdoor booths on one block in downtown Pittsburgh.

Carl W. Bergquist, superintendent of public relations, Western Electric Co., Chicago, and for the past year vice president of the National Safety council in charge of finance, was elected president for the coming year, succeeding C. E. Pettibone, American Mutual Liability Insurance Co., Boston.

Vice presidents were elected as follows: Finance, J. I. Banash, consulting engineer, Chicago; engineering, George Sanford, General Electric Co., Schenectady, N. Y.; industrial, C. L. Close, United States Steel Corp., New York; membership, George Opp, Detroit Edison Co., Detroit; administration, G. T. Hellmuth, Chicago, North Shore & Milwaukee railroad, Chicago; councils, John Long, Delaware & Hudson Co., Albany, N. Y.; education, A. W. Whitney, Bureau of Casualty & Surety Underwriters, New York; health, Dr. C. E. A. Winslow, Yale university, New Haven, Conn.; public safety, Edward Dana, Boston Elevated Railways, Boston. Harvey Ellerd, Armour & Co., Chicago, was named treasurer, and W. H. Cameron, 200 Wacker drive, Chicago, was reelected managing director.

H. G. Hensel, Youngstown Sheet & Tube Co., Chicago, was named general chairman of the metals section, succeeding John P. Eib, Illinois Steel Co., Joliet, Ill. Frank Lauerman, Republic Steel Corp., Youngstown, O., was elected vice chairman, and R. L. Schmitt, Louisville Car Wheel & Railway Supply Co., Louisville, Ky., secretary.

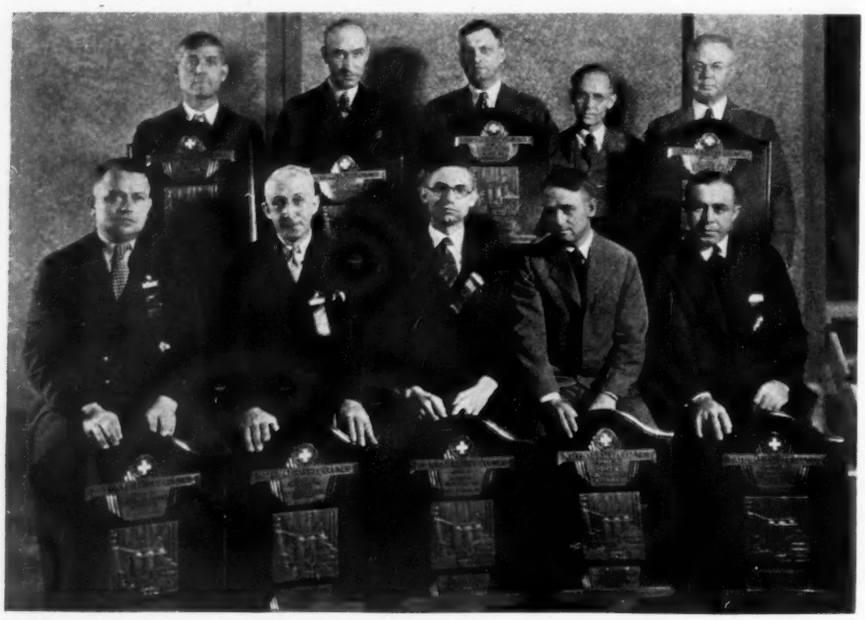
Awards in the annual safety contest were presented to two groups in each of five divisions of the metals section. The 1930 contest attracted 152 entries, compared with 34 in 1929 and represented 173,783 employes who worked 218,411,183 man-hours. In 1929 the contest included 58,800 employes who worked 87,085,498 man-hours.

In the steel mill division, American Rolling Mill Co., East works, Middletown, O., received the first award for plants employing 500 and more men. In the second group, including plants employing from 30 to 500 men, Youngstown Sheet & Tube Co., Hubbard furnaces, Hubbard, O., received first place. In the rolling, furnace and fabricating division, Weirton Steel Co., Clarksburg plant, Clarksburg, W. Va., received first place in the A group, with National Steel Fabric Co. division of the Pittsburgh Steel Co., Monessen, Pa., the winner in the B group.

Iron, Steel Foundry Awards

United States Pipe & Foundry Co., Scottdale, Pa., received the award in the A group among iron foundries, with United States Radiator Corp., Edwardsville plant, Edwardsville, Ill., the winner in the B group. Awards in the steel foundry group went to Pratt & Letchworth Co., Buffalo, and American Rolling Mill Co., Central works, Middletown, O. Winners in the heavy machine shop division were General Electric Co., Philadelphia, and Bryant Heater & Mfg. Co., Cleveland.

Lehigh Portland Cement Co., Allentown, Pa., received an award in recognition of the plant's six years' operation without a lost time accident. Richmond, Va., was winner of first prize in the third industrial accident contest, the award being based on the decrease in industrial accidents compared with those of the preceding year. Second and third places were won by Chattanooga and Kansas City, respectively.



WIN PRIZES IN SAFETY COUNCIL'S METAL SECTION CONTEST

Representatives of the plants awarded plaques received them at the council's safety congress in Pittsburgh last week. Seated, left to right, they are: Charles M. Hanko, National Steel Fabric Co., Monessen, Pa.; E. E. Paddock, Weirton Steel Co., Clarksburg, W. Va.; M. A. Gimbel, General Electric Co., Philadelphia; S. W. Doran, Pratt & Letchworth Co., Buffalo; R. G. Adair, Central works, American Rolling Mill Co., Middletown, O. Rear, left to right: J. R. Byron, East works, American Rolling Mill Co.; C. R. King, United States Pipe & Foundry Co., Scottdale, Pa.; R. W. Hoemsheo, United States Radiator Corp., Edwardsville, Ill.; R. L. Schmitt, Louisville Car Wheel & Railway Supply Co., Louisville, Ky.; J. W. Woltz, Hubbard furnaces, Youngstown Sheet & Tube Co.

Amtorg Purchases a Record

Soviet Russia's purchases in the United States in the fiscal year ended Sept. 30 attained the record total of $145,000,000, exceeding by 35 per cent the figure of 1928-1929. The volume of orders for machinery and equipment, placed by the Amtorg Trading Corp., official Soviet-American trading organization, alone increased from $72,230,000 to $126,500,000.

The rest of purchases for shipment to the Soviet Union consisted principally of cotton. Among machinery

and equipment items were: Agricultural machinery, $65,500,000; industrial and power plant equipment, $44,780,000; automotive and transport equipment totaling $10,500,000. Sales of Soviet products in this country, not including re-exports by way of Europe, amounted to $32,000,000 in the year ended Sept. 30, a gain of 3.5 per cent.

Equipment Outlays in First Half Exceed 1929

Capital expenditure of Class 1 railroads in the first half of 1930 for new equipment and addition and betterments to railway property totaled $468,305,000, according to the Association of Railway Executives. Over the first half of 1929, this was an increase of $118,000,000. Expenditures in the first half year included $41,251,000 for locomotives, $116,012,000 for freight cars, $21,663,000 for passenger cars, $28,933,000 for heavier rails, and $15,888,000 for shops and engine houses including machinery and tools.

Fifty Billions for Homes

Washington—Secretary of Commerce Lamont has been informed by his planning committee on home building that within the next twenty years $50,000,000,000 will be spent for residential home building and that home repairs will be at the rate of approximately $500,000,000 a year.

The committee will be divided into 20 smaller ones consisting of between 500 and 1000 people.

Rate High in «18-8» Steel

New York—Despite the fact business in carbon steel is only sufficient to keep mills going at around 58 per cent of ingot capacity, the reduced level of demand generally has not affected some of the special steels in any notable degree. In particular, the new corrosion and heat-resistant alloy containing 18 per cent chromium and 8 per cent nickel holds up well and some producers have their full capacity engaged in this alloy. This is true because the new alloy is being used in some cases to supplant carbon steel and nonferrous metals.

For 5-Hour Day, 5-Days

Boston—The American Federation of Labor, in annual convention here, will consider this week the recommendation of representatives of the metalworking trades that the federation declare itself in favor of a 5-hour day and a 5-day week in industry. It is expected that this reduction both in the work day and in the work week would relieve the unemployment situation.

Gear Makers, in Fall Meeting, Show Keen Interest in Improved Cost Methods

A FEATURE of the fourteenth annual meeting of the American Gear Manufacturers' association, held at Hotel Clifton, Niagara Falls, Ont., Sept. 29-Oct. 1, was the "commercial standards" day, the second day of the meeting. Questions of costs in the gear industry came in for a major share of attention, those attending evincing a lively interest in methods of costing for profit.

Albert E. Grover, cost accountant, National Machine Tool Builders' association, Cincinnati, presented a paper "Costing for Profits—in the Gear Industry," which was in the form of a series of questions and answers, the various questions dealing with such subjects as labor premiums, burden, depreciation, interest on investment, administrative cost, engineering costs, inventory control and spoiled work. Mr. Grover went to some length in answering the numerous interrogations and the session continued throughout morning, afternoon and evening.

The fall meeting of the gear makers is known as a "work" meeting and much of the business transacted was in the nature of mapping out programs for the various association committees for the winter months. Nearly all committees presented reports, most in the nature of progress reports. The nonmetallic gearing committee presented a proposed revision of recommended practice for computing the horsepower of nonmetallic spur gears composed of laminated phenolic materials or rawhide, which the association formally adopted. The nomenclature committee submitted an extensive report dealing with a proposed suggested standard for future design, relating to gearing nomenclature.

The technical standards session, a feature of all gear maker meetings, was opened this year by an address, "A Look Ahead in Gear Standardization and Research," by C. B. LePage, assistant secretary, American Society of Mechanical Engineers, New York. The third installment of an investigation into load and speed conditions of worm gear drives by Emil Dukes, Gears & Forgings Inc., Cleveland, scheduled for reading, was postponed.

An extemporaneous discussion from slides, considering certain aspects of nitrided steels, was presented by V. O. Homerberg, Massachusetts Institute of Technology, Cambridge, Mass. The discussion which followed centered around the application of these steels to gears and was lead by Prof. Earle Buckingham, also of the Massachusetts institute.

Considering present business conditions, attendance at the meeting was gratifying, according to secretary T. W. Owen, 3608 Euclid avenue, Cleveland. The annual spring meeting of the association will be held at Hotel Statler, Buffalo, May 7-9.

STEEL OFFICIAL BUILDS BARN OF STEEL

The 133 tons of structural shapes for this dairy barn, being erected on the farm of Quincy Bent, vice president, Bethlehem Steel Co., Bethlehem, Pa., were set in seven days. The columns are 48 feet high, and a boom 80 feet long was necessary to set the top purlins, the Crane Service association, Lorain, O., notes with pride. The steel was fabricated and erected by Bethlehem Fabricators Inc., Bethlehem, Pa.

See Last Quarter Car Needs 7.3 Per Cent Below 1929

A FORECAST of carloadings at this time is difficult because of the uncertain outlook that exists in certain industries and the general business condition, but shippers of the country through estimates submitted to the Shippers' Regional Advisory boards anticipate a 7.3 per cent reduction in carloadings of 29 principal commodities in the last quarter, compared with a year ago.

Twelve of the 13 advisory boards anticipate cuts in car needs, the lone exception being the Atlantic States board, comprising New York, Pennsylvania, New Jersey, Delaware and parts of Maryland and Virginia. Combined advisory boards have a membership in excess of 16,000 persons representing every section of the United States and virtually every industry. These estimates are furnished quarterly.

Of significance in individual industries is a decline of 5.8 per cent predicted in carloadings of iron and steel in the fourth quarter from the actual requirements of the fourth quarter of 1929. The drop in the Allegheny region is 3.9 per cent, where it is estimated 197,160 cars will be required against the actual use of 205,161 last year. In this classification a 10.1 per cent loss is figured for the Great Lakes states and a 5 per cent gain in the Ohio valley.

Autos, trucks and tractors seem destined for a 22 per cent shrinkage from fourth quarter of 1929. All reporting districts expect to require 112,133 cars, against last year's actual 143,718. In this division the Great Lakes district is, of course, the largest taker; its estimated need for 64,954 freight cars is 23.7 per cent below last year.

When the Shippers' Regional Advisory boards made their estimates for third-quarter of 1930 needs they placed the total for all regions at 508,216 cars, or 11.9 per cent below the actual takings of 577,102 units a year ago.

Fourth Quarter Carloadings

Region	Actual 1929	Estimated 1930	Per Cent Change
Atlantic	916,318	953,945	+ 4.1
Cent'l West.	361,597	330,422	— 8.6
Pac. Coast..	340,322	328,262	— 3.5
Pac. N. W...	283,328	248,941	—12.1
Gt. Lakes....	513,545	445,650	—13.2
Ohio Valley	967,718	855,472	—11.6
Mid-West ..	1,293,842	1,150,363	—11.1
Northwest ..	465,159	422,486	— 9.2
Trans.-Mo.-Kansas	438,731	425,425	— 3.0
Southeast ..	850,899	793,621	— 6.7
Southwest ..	614,873	567,265	— 7.7
New Eng. ..	179,868	177,765	— 1.2
Allegheny ..	1,029,712	956,175	— 7.1
Total	8,255,912	7,655,792	— 7.3

In the table shown above are itemized the totals for all districts and percentage changes. This is for fourth quarter, 1930. The large table at the bottom of this and the next page gives detailed statistics for commodities affiliated with iron and steel in principal producing and consuming centers.

Girdler Sees Evidence of Steel Prices at Lowest

Tom M. Girdler, chairman and president of Republic Steel Corp., Youngstown, O., believes steel prices are touching bottom. The most convincing evidence of this, he says, is found in the attitude of customers themselves. For the first time in many months buyers are showing an increasing interest in making purchases for future delivery indicating growing confidence in the underlying firmness of prices.

"It is significant," says Mr. Girdler, "that at a time of reduced operations in the steel industry some large buyers are seeking to place orders at current price levels for first quarter of 1931 requirements. Producers, however, are disinclined to accept commitments beyond the end of the current year."

See Progress on Corrigan McKinney-Newton Merger

Cleveland—Although interested officials are noncommittal, it is believed that progress is being made on the proposed merger of the Corrigan-McKinney Steel Co., Cleveland, and the Newton Steel Co., Newton Falls, O., and Monroe, Mich.

One report is that the Newton Company will exchange part of its common stock for Corrigan, McKinney preferred, in turn reissuing the latter to Newton stockholders. In this way control of Newton, a large consumer of sheet bars, would pass to the Corrigan, McKinney company, a large producer of these bars.

British Sheetmaker Will Make American Quality

John Summers & Sons Co. Ltd., Chester, Eng., large producer of steel sheets, which is affiliated with the American Rolling Mill Co., Middletown, O., is planning an extension of its automobile sheet capacity to meet expected demands from British builders. The two companies have been co-operating in solution of

Fourth Quarter Freight Car Requirements Are

COMMODITY	TOTAL ALL REPORTING DISTRICTS Carloadings Actual 1929	Estimated 1930	Per Cent Change	NEW ENGLAND Carloadings Actual 1929	Estimated 1930	Per Cent Change	ALLEGHENY Carloadings Actual 1929	Estimated 1930	Per Cent Change	ATLANTIC STATES Carloadings Actual 1929	Estimated 1930	Per Cent Change
Iron, Steel	460,805	433,883	— 5.8	6,214	5,593	—10.0	205,161	197,160	— 3.9	77,485	77,485	....
Autos, Trucks, Parts	143,718	112,133	—22.0	1,160	986	—15.0	826	1,306	+58.1	5,560	4,954	—10.9
Machinery, Boilers	55,146	46,944	—14.9	5,179	3,625	—30.0	5,270	5,017	— 4.8	13,979	11,879	—15.0
Implements, Vehicles	21,611	17,859	—17.4	148	148	.....	48	40	—16.7	.....	.....	....
Ore, Concentrates	428,144	341,725	—20.2	335	335	.....	.....	.....	.....	23,915	21,261	—11.1
Coal and Coke	2,790,470	2,606,386	— 6.6	26,729	29,402	+10.0	646,434	598,598	— 7.4	421,733	460,994	+ 9.3
Chemicals, Explosives	30,364	28,121	— 7.4	522	471	— 9.8	6,387	5,276	—17.4	8,446	8,261	— 2.2
Oil and Products	601,636	613,073	+ 1.9	27,121	31,189	+15.0	25,878	25,930	+ 0.2	70,421	74,646	+ 6.0
Gravel, Sand, Stone	667,019	602,673	— 9.6	9,694	9,694	.....	51,887	49,760	— 4.1	73,044	75,965	+ 4.0
Brick, Clay Products	134,093	113,511	—15.3	2,697	1,888	—30.0	39,377	32,289	—18.0	11,073	9,413	—15.0
Cement	159,949	153,359	— 4.1	3,778	4,042	+ 7.0	7,821	7,516	— 3.9	48,140	43,326	—10.0
*TOTAL ALL COMMODITIES	8,255,912	7,655,792	— 7.3	179,868	177,765	— 1.2	1,029,712	956,175	— 7.1	916,318	953,945	+ 4.1

*Grain, dairy products, vegetables, forest products, etc., included in addition to those listed above.

problems presented by different conditions in England and have attained proper quality for automotive use. Geoffrey Summers and Spencer Summers of the English firm have come to the United States to settle with officials of the American Rolling Mill Co. final details of the extensions.

Sheet & Tube To Classify Position of Dissenters

Youngstown Sheet & Tube Co., Youngstown, O., has filed its first suit in the Youngstown-Bethlehem merger controversy in which it has several times been a defendant.

A petition requesting the Mahoning county common pleas court to determine whether interests opposing the Bethlehem merger are entitled to receive cash for their Sheet & Tube holdings instead of Bethlehem Steel Co. stock was filed Oct. 4 by the Sheet & Tube company.

The petition asks the courts to determine the fair cash value of dissenting stock, provided it is ruled that dissenters are entitled to cash surrender, and asks that a hearing on the petition be held Jan. 12, 1931.

All dissenting shareholders are named as defendants in the suit, which was filed in accordance with Ohio's general corporation act. The appointment of three appraisers to determine the value of Sheet & Tube shares on April 7, the day before the merger vote, is also asked in the petition.

Suits representing 280,492 shares of Sheet & Tube common stock have been filed in the local common pleas court in behalf of stockholders opposed to the merger with Bethlehem. Additional suits were filed for Cyrus S. Eaton, leader of the opposition to the new merger, Union Trust Co. of Cleveland, and the Youngstown, O., brokerage house of Wick & Co., all asking amounts ranging from $170 to $250 a common share. The Sheet & Tube management have offered $110.

Dividends Maintained; Steel Corp. Holders at Highest

STOCKHOLDERS of the United States Steel Corp., when books were closed in September for the Oct. 1 dividend, numbered 135,504, a new high record. Three months ago stockholders totaled 129,626 and a year ago 110,166.

When books are closed in December another increase will be shown, as 225,790 additional shares of Steel corporation common are being listed to effect the purchase of the Oil Well Supply Co., Pittsburgh.

Wilson-Snyder Mfg. Co., Pittsburgh, has called for redemption Dec. 1 its issue of $800,000 6 per cent debentures, at 103 and accrued interest.

National Acme Co., Cleveland, has declared regular quarterly dividend of 37½ cents a share on common stock payable Nov. 15 to record Oct. 31.

Pittsburgh Steel Co., Pittsburgh, has declared a 50-cent dividend on common stock, compared with $1 paid quarterly previously.

Crucible Steel Co. of America, New York, has declared the usual quarterly dividend of $1.25 per share on its common stock.

Pittsburgh Forging Co., Pittsburgh, has declared the regular quarterly dividend of 40 cents a common share, payable Oct. 25 to holders of record Oct. 15.

American Can Co., New York, has declared an extra dividend of $1 on common stock. Regular quarterly dividend of $1 payable Nov. 15 to stock of record Oct. 31, also was declared.

American Machine & Foundry Co., Brooklyn, N. Y., has declared two extra dividends on common stock, one of 5 cents and one of 20 cents, in addition to regular quarterly dividend of 35 cents on the new common stock.

Michigan Steel Corp., Detroit, declared its regular quarterly divided of 62½ cents a common share, payable Oct. 20 to record Sept. 30. Stock dividend of 1 per cent declared in June is also payable Oct. 20.

Marion Steam Shovel Co., Marion, O., has omitted the quarterly dividend due at this time of $1.75 a share on preferred stock. A net loss of $108,731 for the first six months was reported.

Union Metal Mfg. Co., Canton, O., has declared the usual quarterly dividend of 50 cents a share on common stock, and in addition an extra dividend of 25 cents a share payable Oct. 1. The regular quarterly dividend of $2 a share on the preferred was also declared.

Fostoria Pressed Steel Corp., Fostoria, O., reports net profit of $26,411, equivalent to 95 cents a common share, for the first half year. This compares with $53,930 or $1.96 a share a year ago. First-half sales totaled $363,980. Regular quarterly common dividend of 50 cents was declared.

MacKinnon Steel Co. Ltd., Sherbrooke, Que., fabricator of structural steel, earned $3.07 a common share in the fiscal year ended July 31. This compares with $2.53 a share in reorganization period from Oct. 20, 1928, to July 31, 1929. Operating profits of the fiscal year were $102,816, compared with $79,847 in the previous period.

Steel barrels totaling 367,422 were shipped during August by report of members of the Steel Barrel Manufacturers' institute, Cleveland. Production was at 31.6 per cent of capacity.

Forecast to be 7.3 Per Cent Below 1929 Needs

GREAT LAKES Carloadings			OHIO VALLEY Carloadings			MID-WEST Carloadings			SOUTH-EAST Carloadings			
Actual 1929	Estimated 1930	Per Cent Change	Actual 1929	Estimated 1930	Per Cent Change	Actual 1929	Estimated 1930	Per Cent Change	Actual 1929	Estimated 1930	Per Cent Change	COMMODITY
49,464	44,464	—10.1	20,270	21,283	+ 5.0	57,361	48,759	—15.0	25,650	20,520	—20.0	.....Iron, Steel
85,105	64,964	—23.7	7,193	5,395	—25.0	16,095	13,680	—15.0	6,675	6,675	....	.....Autos, Trucks, Parts
8,125	7,053	—13.2	7,099	6,390	—10.0	10,109	8,087	—20.0	1,870	2,031	+ 7.0	.....Machinery, Boilers
1,178	953	—19.1	1,194	1,159	— 2.9	15,551	12,240	—20.0	876	876	....	....Implements, Vehicles
104,970	82,000	—21.9	856	856	....	54,239	45,560	—16.0	11,831	10,648	—10.0	.....Ore, Concentrates
16,509	15,500	— 6.1	733,627	660,265	—10.0	560,000	509,600	— 9.0	116,408	98,947	—15.0	.....Coal and Coke
....	....	....	1,374	1,374	....	5,161	4,129	—20.0	3,815	3,815	....	....Chemicals, Explosives
23,422	23,400	....	18,282	16,271	—11.0	57,366	63,100	+10.0	56,434	58,127	+ 3.0	.....Oil and Products
73,448	49,211	—33.0	62,249	56,025	—10.0	117,957	82,570	—30.0	79,553	87,508	+10.0	....Gravel, Sand, Stone
7,843	6,493	—17.2	12,487	11,239	—10.0	22,404	18,371	—18.0	16,172	13,746	—15.0	.....Brick, Clay Products
9,306	8,400	— 9.7	9,494	8,830	— 7.0	18,096	16,581	— 8.4	15,485	15,950	+ 3.0	..... Cement
513,545	445,650	—13.2	967,718	855,472	—11.6	1,293,842	1,150,363	—11.1	850,899	793,621	— 6.7	TOTAL—ALL .....COMMODITIES*

Czecho-Slovakia Entertains British Steel Institute

GENUINE admiration for the people of Czecho-Slovakia was felt by the members of the British Iron and Steel institute, who held their autumn meeting in the Czech capital, Prague, Sept. 15 and 16. The meeting was under the patronage of the Czecho-Slovak government, and by invitation of the Society of Czecho-Slovak Engineers with the support of the iron and steel industrialists of Czecho-Slovakia.

The delegates numbered 145 and were headed by Professor Henry Louis, president of the institute. There was a considerable number of British members and many others from Czecho-Slovakia, Austria, France, Germany, Japan, Rumania, Spain, Sweden and the United States. On arrival at the Czech frontier at Cheb, the British party was met by a delegation representing the reception committee. The patron of this committee was His Excellency Dr. Josef Matousek, minister of commerce, industry and trade, and the British Minister in Prague, Joseph Addison, also was a member. Ing. Dr. Vladislav Sykora, president of the Society of Czecho-Slovak Engineers, was chairman of the executive committee, and Josef Lubina, a director and secretary of the society, was honorary secretary.

The sessions were held in the house of the Society of Czecho-Slovak Engineers. At the opening of the first session addresses of welcome were presented by Dr. Sykora, Dr. Matousek, Dr. K. Baxa, Lord Mayor of the city of Prague, and Dr. A. Sonnenschein, managing director of the Vitkovice Mines, Steel & Ironworks Corp. Professor Henry Louis replied.

In the afternoons of Monday and Tuesday, places of interest in Prague were visited. Monday night a banquet was offered at the castle by invitation of the minister of commerce, industry and trade. Tuesday night a special performance was given at the national theatre. Wednesday the party visited the Skoda works and the famous brewery at Plzen, the visitors being entertained for lunch by the Skoda works. Thursday they arrived at Trinec and visited the works of the Czecho-Slovak Mining & Ironworks Co.* After being entertained for lunch at the works hotel, the party started for Moravska Ostrava. On the way they stopped at Karvinna, where a garden party was offered to them by Dr. and Mrs. Larisch-Monich at their castle of Solca, the host being an important coal owner. Friday was devoted to visits to the various works of the Vitkovice Mines, Steel & Ironworks Corp. and in the evening a banquet was offered by the management of the works. Saturday the party returned to Prague and, in the evening, attended a banquet offered by Eugene Schneider, president of the Skoda works and chairman of the Czecho-Slovak Mining & Ironworks Co.

Eleven papers of a practical character were presented. The first paper Monday was: "The Heterogeneity of an Ingot Made by the Harmet Process," by Dr. Ing. Ant. Kriz, manager of the Skoda works, in which the speaker gave a complete study of ingots up to 30 tons. The discussion was opened by Dr. W. H. Hatfield, Sheffield, president of the committee on heterogeneity of steel ingots of the institute, who questioned whether the pressure during solidification diminishes heterogeneity. He believes that the process of differential freezing remains unchanged, and that the heterogeneity remains, accompanied by a certain displacement of the matter in the ingot. The industry today needs ingots up to 50, 100 and 150 tons, and for such ingots the Harmet process is limited by the capacity of the press.

American Comments on Paper

Professor Bradley Stoughton, Bethlehem Steel Co., stated that in the United States the practice of the Harmet process has been given up during the past few years, due to the length of time and cost. The paper, however, made him feel that a mistake may have been made in discarding this process, which, according to conclusions of the author, tends to improve the ingot. Dr. Stoughton paid tribute to the quality of the ingots he had seen turned out at the Skoda works.

Dr. Ing. J. Sarek, of the Prague Ironworks Co., presented a paper entitled: "What Reason Compelled the Prague Ironworks Co. to Introduce Thin-Walled Blast-Furnaces?" W. Simons, Cardiff, Wales, vice president, stated that in America blast-furnaces now were built along lines indicated in the paper, while in Germany they are built more on British lines, showing that opinion is not universal with regard to merits.

The session ended with a paper by Dr. W. H. Hatfield, of the Brown-Firth Research Laboratories, Sheffield, on the "Permanence of Dimensions Under Stress at Elevated Temperatures."

The session Tuesday opened with a paper by Professor Otakar Quadrat, department of metallurgy, technical University, Praha, entitled; "A Contribution to the Problem of the Analysis of Basic Slags and the Representation of Their Composition

WHEN BRITISH INSTITUTE MET IN CZECHO-SLOVAKIA

Inspecting the blast-furnace plant at Vitkovice, left to right, are: W. Gutmann, mine owner; F. W. Harbord, C.B.E., past-president, Iron and Steel institute; Sir William J. Larke, K.B.E., honorary member of council, director of the National Federation of Iron and Steel Manufacturers; Eugene Schneider, Sc.D., past-president; Dr. A. Sonnenschein, general manager, Vitkovice Mines, Steel & Ironworks Corp.; Dr. O. Kruliz-Randa, general manager, Czechoslovak Mining & Ironworks Co.; Mrs. Hoffmann; unidentified; Prof. Henry Louis, M.A., D.Sc., president, the institute; G. C. Lloyd, secretary, the institute; Ing. Dr. V. Sykora, managing director, Prague Iron & Steel Co., president, Institute of Czechoslovak Engineers, honorary vice-president, Iron and Steel institute; A. Hutchinson, M.A., B.Sc., vice-president, the institute; and Comte de Cosse-Brissac, of Schneider & Co., Le Creusot

*The works of the Czecho-Slovak Mining and Ironworks Co. were described in *Iron Trade Review* of April 19, 1928, those of Vitkovice in *Iron Trade Review* of Aug. 23-30, 1928, and the Skoda works will be described in a forthcoming issue of STEEL.

in a Triangular Diagram." It was the consensus of opinion that the triagular diagram was somewhat misleading.

H. C. Wood, Wellman Smith Owen Engineering Corp. Ltd., London, presented a paper entitled: "Open-Hearth Furnace Steelworks. A Comparison of British and Continental Installations and Practice."

J. Henderson, Frodingham Iron & Steel Co. Ltd., Scunthorpe, said that the size of the open-hearth furnaces in his works has been increased up to 300 tons, and that as a consequence he has found greater efficiency and lower labor costs. Mr. Simons stated his opinion that more replacement was needed in British steelworks, and that old furnaces should be scrapped to make way for new ones. He mentioned that in America the venturi furnace with sloping back wall is used. He believes, however, that the advantages today lie with the tilting furnace.

Prof. Bradley Stoughton said that the paper was of great practical interest. He stated that he was struck by the great speed at which the European steelmakers bring out their heats in comparison with conditions in the United States. Referring to the venturi furnace, he said that the reason why the sloping back wall apparently had not developed in Europe was due to the development of the tilting furnace. In America there are few tilting furnaces, and it has been found that the sloping back wall is advantageous, as it is easy to repair. Referring to the question of refractories, Dr. Stoughton said that dolomite is no longer used in the United States for the first hearth, although it still is used in Europe. He added that the latest hearth used in America is made of fine magnesite bound with hydraulic cement, and that such a hearth had lasted for three years.

Quality Not Improved

D. Sillars, of Bolckow, Vaughan & Co. Ltd., Middlesbrough, said that while recognizing the advantages of the tilting furnace, he does not believe that the quality of steel is improved in the larger furnaces. He mentioned the case of a works in Germany where the furnaces are only half-charged when high-quality steel is required. Mr. Colclough pointed out that in Germany and America coke-oven gas now is used, mixed with blast-furnace gas instead of being used cold and raw as previously.

In his reply to the discussion, the author mentioned the fact that the Youngstown Sheet & Tube Co. and the Jones & Laughlin Steel Corp. have been inquiring with respect to a furnace of the Terni type.

The next paper was by D. F. Campbell, 17 Victoria Street, London, S. W. I, on "High-Frequency Steel Furnaces." He pointed out that France has best appreciated and developed the high-frequency furnace. In the discussion, Dr. Hatfield stated that, in his opinion, the high-frequency furnace is practical only for high-quality and special steel, and not for production steel. He questioned whether one obtains full control, particularly with regard to temperature of the steel. J. Henderson also pointed out that there are several difficulties with respect to certain details, such as testing and control, owing to the small capacity of the furnace. He stressed the high cost per ton-hour, which is much higher than that of the Siemens-Martin or open-hearth practice.

The session ended with a paper by L. W. Schuster, of the British Engine, Boiler & Electrical Insurance Co. Ltd., Manchester, on "The Effect of Contamination by Nitrogen on the Structure of Electric Welds." Other papers presented but not read, were "A Contribution on the Constitution of the Fe-C-Si System," by A. Kriz and F. Poboril; "The Magnetometric Determination of the Curie Points," by Albert Regner; "The Quantitative Analysis of Steels by Spectrum Analysis," by F. Twyman and A. A. Fitch; "The Mechanism of the Solution of Cementite in Carbon Steel and the Influence of Heterogeneity," by Erik Walldow.

Directors of The American Oil Burner association will hold their next regular quarterly meeting at the Ritz-Carlton hotel, Atlantic City, N. J., Oct. 14. The executive committee will meet Oct. 13.

Significant Developments of the Week in the World of Business

WESTERN ELECTRIC CO., Chicago, is taking bids on an addition of 200,000 square feet. According to C. L. Rice, vice president, the building is not needed now but if building costs are as low as reported the economy will warrant immediate construction.

Union Pacific railroad shops at Ogden, Utah, have resumed full-time operations.

"Sentiment continues conservative as the business horizon is carefully scanned for signs of definite improvement," states the First National Bank of Boston. "Indications are that we may have a moderate fall upturn but the recovery, if it comes now, is likely to be slow and irregular."

Republic Steel Corp., Youngstown, O., made a new high monthly record for shipment of pipe in September, exceeding the total of August by 25 per cent. With all three units of the electric welding pipe mill booked to capacity through October another record month is expected. Production of welded pipe now is at the rate of 22 miles daily.

"In times like the present the public is easily mislead by fantastic rumors," thinks the National City Bank, New York, going on to add, "Just as a year ago the mood was to exaggerate every favorable bit of news and ignore unfavorable symptoms, so now the pendulum has swung the other way and bad news is played up and good news thrust in the background."

Gains in both wholesale and retail automobile sales during August, as compared with July, are shown in a monthly study of midwest automobile distribution by the federal reserve bank of Chicago. August fell far short of equaling August, 1929, sales, but the drop was smaller than in either July or June.

Chicago, Milwaukee, St. Paul & Pacific railroad is gradually rehiring men at its West Milwaukee, Wis., shops. It was expected there would be 2500 men at work in the shops by Oct. 1. Orders have been received to go ahead with the original production program announced for the shops earlier in the year.

D. C. Elliott, economist, Midland bank, Cleveland: "The automobile industry has a long development ahead and the saturation point of production has by no means been reached. Just now the industry is in a period of depression, but it will recover and go ahead of its previous records. Its position is secure."

The assembly of the League of Nations, which Sept. 23 ordered a scientific, world-wide investigation of the present economic depression and its causes, has been informed by the gold delegation of the league that there probably will be a shortage of new gold for monetary purposes by 1934.

United States Steel Corp., and subsidiaries, had total assets of $2,396,066,088 as of June 30, compared with $2,286,183,654 on Dec. 31, 1929. The figures were disclosed in the Corporation's listing 225,790 additional shares on the New York Stock Exchange, approximately half of which will be used in acquisition of business, properties and assets of Oil Well Supply Co.

Ingot Output in September Lowest in Six Years

AFTER the slight gain in August over July, production of steel ingots in September fell off sharply, declining 7.6 per cent from the daily rate of August. Total production in September, according to figures of the American Iron and Steel institute, was 2,273,668 tons, compared with 2,543,446 tons in August. September, 1924, furnishes the most recent month with a lower total production.

The daily average production of all companies reporting was 110,307 tons, compared with 119,050 tons in July. The number of working days in each month was 26.

Total production of open-hearth and bessemer ingots for nine months of 1930 is 30,816,739 tons, compared with 40,863,920 tons in the same period of 1929. This is a drop of close to 25 per cent. The daily average output so far this year has been 140,300 tons, a decline of nearly 25 per cent from the 186,068 tons average for the first three quarters of 1929.

The daily rate of operation has been 70.08 per cent for nine months of 1930, compared with 94.88 for the same period in 1929.

Week's Coal Output Up

Preliminary aggregate for bituminous coal production in the week ended Sept. 27 stood at 9,100,000 net tons, comparable to revised total of 8,920,000 tons in the week previous. Calendar year to date sums up to 336,262,000 tons, 14 per cent below 1929, according to the bureau of mines.

Foundry Equipment Orders Move Lower in August

With the exception of the June index of gross orders for foundry equipment, monthly decline was furthered for 1930 when August showed an 85.2 relation to the average monthly orders of the three successive years beginning 1922. Foundry Equipment Manufacturers' association reports further that shipments likewise fell in August, though unfilled orders remained constant at the July rate. Following is shown gross orders' index by months:

	1927	1928	1929	1930
Jan.	180.4	132.7	180.5	160.1
Feb.	198.0	123.6	197.0	196.4
Mar.	131.1	138.6	209.4	164.1
Apr.	130.0	107.7	172.6	122.8
May	134.8	335.6	177.7	92.7
June	138.4	149.1	177.3	102.1
July	89.9	94.8	219.3	90.6
Aug.	106.4	278.0	229.5	85.2
Sept.	80.4	170.0	216.3	.....
Oct.	98.0	185.0	245.3	.....
Nov.	95.8	197.8	128.6	.....
Dec.	106.8	166.5	208.0	.....

Base: Average monthly shipments for 1922-23-24 taken as 100.

Babbitt Falls To Low Level

Total production of babbitt metal for sale for August was 1,783,331 pounds as compared with 2,022,058 pounds for July and 3,997,427 pounds for August of 1929. Firms consuming their own production of babbitt showed a gain for August. Total apparent consumption in 1930, from figures of the department of commerce, lags 16,500,000 pounds behind 1929, according to the following:

	Total apparent consumption	Sold by manufacturers	Consumption by producers
	(Figures given in pounds)		
1929			
Aug...	5,432,597	3,997,427	1,435,170
(8 mos.)	46,525,380	36,664,053	9,861,427
Sept...	5,225,004	3,887,599	1,337,405
Oct...	5,518,851	4,007,260	1,511,591
Nov...	4,522,034	3,205,689	1,316,345
Dec...	3,343,492	2,394,159	949,333
Total (year)	65,134,861	50,158,760	14,976,101
1930			
Jan...	4,408,455	3,405,041	1,003,414
Feb...	3,426,576	2,525,771	900,805
March	5,051,575	4,039,395	1,012,180
April	3,868,408	2,838,877	1,029,531
May*	3,932,501	3,003,298	929,203
June	3,702,989	2,546,606	1,146,383
July*	2,907,977	2,022,058	885,919
Aug.	2,737,121	1,783,331	953,790
(8 mos.)	30,035,602	22,164,377	7,871,225

*Revised.

Coke Tonnage Off Further

Decline of by-product coke production was continued with August at 3,637,339 net tons, compared with the July figure of 3,770,426 tons. Beehive was also in a slump and total coke output this year from compilations of the bureau of mines lags in comparison with 1929:

	(In net tons) By-product coke	Beehive coke	Total coke
1929			
Aug.	4,642,785	561,800	5,204,585
(8 mos.)..	35,950,237	4,282,300	40,232,537
1930			
Aug.	3,637,339	169,500	3,806,839
(8 mos.)....	32,467,162	2,109,300	34,576,462

Steel Ingot Production—1929-30

94.27 Per Cent of Industry Reporting
Gross Tons

1929	Open-hearth	Bessemer	Monthly output companies reporting	Calculated monthly output all companies	Number of working days	Approximate daily output all companies	Per cent of operation
Jan.	3,692,062	549,616	4,241,678	4,500,209	27	166,674	84.99
Feb.	3,590,826	489,279	4,080,105	4,328,789	24	180,366	91.97
Mar.	4,180,408	596,691	4,777,099	5,068,265	26	194,933	99.40
Apr.	4,025,409	640,351	4,665,760	4,950,139	26	190,390	97.08
May	4,275,161	707,484	4,982,645	5,286,339	27	195,790	99.84
June	3,999,363	622,585	4,621,948	4,903,657	25	196,146	100.02
July	3,922,053	649,950	4,572,003	4,850,668	26	186,564	95.13
Aug.	3,987,400	668,023	4,655,423	4,939,172	27	182,932	93.28
Sept.	3,624,954	642,886	4,267,840	4,527,966	25	181,119	92.35
9 mos.	35,297,636	5,566,284	40,863,920	43,353,909	233	186,068	94.88
Oct.	3,631,674	642,235	4,273,909	4,534,405	27	167,941	85.64
Nov.	2,796,214	522,672	3,318,886	3,521,173	26	135,430	69.06
Dec.	2,375,797	360,489	2,736,286	2,903,063	25	116,123	59.21
Total	44,101,321	7,092,261	51,193,582	54,313,845	311	174,643	89.05
1930							
Jan.	3,137,002	441,572	3,578,574	3,796,090	27	140,596	70.22
Feb.	3,336,021	508,618	3,844,639	4,078,327	24	169,930	84.88
Mar.	3,513,904	539,616	4,053,520	4,299,905	26	165,381	82.60
Apr.	3,406,610	509,234	3,915,844	4,153,860	26	159,764	79.80
May	3,265,190	528,968	3,794,158	4,024,778	27	149,066	74.45
June	2,835,527	407,586	3,243,113	3,440,239	25	137,610	68.73
July	2,411,592	353,723	2,765,315	2,933,399	26	112,823	56.35
Aug.	2,543,466	374,467	2,917,933	3,095,293	26	119,050	59.46
Sept.	2,273,668	429,975	2,703,643	2,867,978	26	110,307	55.10
9 mos.	26,722,980	4,093,759	30,816,739	32,689,869	233	140,300	70.08

Figures exclude crucible and electric ingots. Operating percentages for 1929 are based on capacity of 60,990,810 gross tons as of Dec. 31, 1928; for 1930 on capacity of 62,265,670 tons as of Dec. 31, 1929.

September Iron Production Loss Is More Pronounced

REGISTERING another drop, production of coke pig iron shrank to a level which was the lowest in six years and accompanying it was further curtailment of active blast furnaces which carried the total to the smallest number in nearly nine years. Since ironmaking operations went on the decline five months ago, production has slipped from 106,371 tons per day in April to 75,893 tons in September, and active stacks have been pared down from 184 in March to 126 last month. Unless a number of furnaces resume shortly, the net loss of 11 in September will be reflected in lower production in October.

Pig iron was made at the rate of 75,893 gross tons per day in September, which compared with 81,455 tons in August, and was a decrease of 5562 tons, or 6.8 per cent. This rate was the lowest since the 68,454 tons in September, 1924. In September one year ago, daily production was 116,548 tons. For nine months this year, the daily rate has averaged 94,304 tons, against 115,808 tons per day for all of 1929.

Total output of iron in September was 2,276,781 gross tons, and a loss of 248,324 tons, or 9.8 per cent, from the August figure of 2,525,105 tons. September had 30 days, while August had 31. Production in September, 1929, was 3,496,454. For nine months of the current year, output has been 25,744,941 tons, as compared with 32,682,700 tons in the corresponding period of 1929 and 27,783,662 tons in 1928.

Relating production to potential capacity, operations in September were 53.8 per cent, against 57.8 per cent one month before and 83.3 per cent in September, 1929.

Active blast furnaces on Sept. 30 totaled 126, against 137 on August 31 and 144 on July 31. Since March, 58 furnaces have been removed from blast, 2 each in April and May, 18 each in June and July, 7 in August and 11 in September. The 126 operating stacks was the smallest since December, 1921, when 123 were making iron. During September, 2 merchant furnaces were blown out and none blown in; of the nonmerchant or steelworks class, 13 were blown out or banked and 4 blown in.

With the Low Moor Iron Co., Low Moor, Va., announcing the dismantling of its two furnaces, the potential number of stacks in the country is reduced from 312 to 310.

Furnaces blown in during September were: In Pennsylvania: Cambria D and Cambria L, Bethlehem Steel Co. In Indiana: Madeline No. 2, Inland Steel Co. In Alabama: Fairfield No. 5, Tennessee Coal, Iron & Railroad Co.

Stacks blown out or banked were: In Ohio: Ohio No. 5, Carnegie Steel Co.; Martins Ferry, Wheeling Steel Corp.; Trumbull Cliffs, Trumbull Cliffs Furnace Co. In Pennsylvania: Shenango Furnace Co.; Lucy No. 2, Carnegie Steel Co. In New York: Niagara A., Tonawanda Iron Co.; Lackawanna J, Bethlehem Steel Co. In Alabama: Ensley Nos. 3, 4 and 6, Tennessee Coal, Iron & Railroad Co. In Kentucky: Ashland No. 1, American Rolling Mill Co. In Indiana: Madeline Nos. 2 and 4, Inland Steel Co. In Illinois: South Works No. 10, Illinois Steel Co. In Minnesota: Zenith, Interlake Iron Corp.

AVERAGE DAILY PRODUCTION

	1930	1929	1928	1927
Jan.	91,573	110,742	92,113	100,043
Feb.	101,640	114,942	99,954	105,021
Mar.	104,930	119,662	103,199	112,326
Apr.	106,371	122,106	106,066	114,146
May	**104,564**	**125,753**	**106,219**	**109,388**
June	97,817	123,887	102,745	102,991
July	85,110	122,016	99,120	95,311
Aug.	81,455	120,845	101,193	95,183
Sept.	75,893	116,548	102,120	92,750
Oct.	.....	115,747	108,824	90,710
Nov.	.....	106,081	110,155	88,728
Dec.	.....	91,513	108,702	87,039
Ave.	94,304	115,808	103,365	99,422

MONTHLY PRODUCTION

	1930	1929	1928
Jan.	2,838,751	3,433,028	2,855,515
Feb.	2,845,937	3,218,376	2,898,668
Mar.	3,252,822	3,709,518	3,199,175
April	3,191,119	3,663,167	3,181,975
May	3,241,477	3,898,344	3,292,790
June	2,934,508	3,715,104	3,082,340
July	2,638,441	3,782,511	3,072,711
Aug.	2,525,105	3,746,198	3,136,995
Sept.	2,276,781	3,496,454	3,063,593
Total 9 Mos.	25,744,941	32,682,700	27,783,662
Oct.	.....	3,588,146	3,373,539
Nov.	.....	3,182,420	3,304,656
Dec.	.....	2,836,917	3,369,784
Total	.....	42,270,183	37,831,741

RATE OF OPERATION

(Relation of Production to Capacity)

	1930†	1929*	1928‡
January	65.0	79.0	66.8
February	72.1	82.2	72.5
March	74.5	85.5	74.8
April	75.4	87.4	76.8
May	74.2	89.8	77.0
June	69.3	88.5	74.4
July	60.3	87.2	71.8
August	57.8	86.4	73.3
September	53.8	83.3	74.1
October	.....	82.6	78.9
November	.....	75.8	79.8
December	.....	65.5	78.8

†Based on capacity of 51,490,790 tons Dec. 31, 1929; *on capacity of 51,069,895 tons; ‡on capacity of 50,329,750 tons. Capacities by American Iron and Steel institute.

SEPTEMBER PIG IRON PRODUCTION

	No. in blast last day of month		Total tonnage made	
	Sept.	Aug.	Merchant	Nonmerchant
Ohio	27	30	65,604	429,300
Pennsylvania	45	45	55,143	714,541
Alabama	11	13	105,460	56,307
Illinois	11	12	73,227	150,937
New York	7	9	55,095	60,283
Colorado	2	2		
Indiana	8	9		
Maryland	4	4	7,487	297,500
Virginia	1	1		
Wisconsin	0	0		
Kentucky	0	1		
Massachusetts	1	1		
Tennessee	0	0	17,536	81,635
Utah	1	1		
West Virginia	3	3		
Michigan	4	4		
Minnesota	1	2	27,743	53,943
Missouri	0	0		
New Jersey	0	0		
Spiegel and ferro —all states			3,859	21,181
Total	126	137	411,154	1,865,627

Form American Group To Contest Soviet Trade

Washington—To assemble information and present a united appeal in behalf of American industries and labor affected by Soviet imports, leaders of American industries most affected by the Russian program have organized a temporary co-operative committee known as "Joint Conference on Unfair Russian Competition."

This committee will serve as a clearing house for information on the importation of Soviet products. Industries represented on the committee are manganese, lumber, matches, sausage casing, glue and coal. It is expected that wheat and fur will be added.

J. Carson Adkerson, president, American Manganese Producers association, 501 Fifth avenue, New York, is chairman of the committee.

Ford Plant To Melt Autos with 400-ton Open Hearth

To facilitate the melting down of scrap automobiles, the Ford Motor Co., Detroit, has ordered a 400-ton tilting open-hearth steel furnace from the Pennsylvania Engineering Works, New Castle, Pa. This is expected to be the largest open-hearth furnace in operation in the United States and will be especially equipped to be charged with crushed automobiles taken off the dis-assembly line at Fordson.

Industrial Men in the Day's News

Alfred J. Bragg, Head of Egleston Bros. & Co. Inc., Large Eastern Iron and Steel Jobber

ONE of the youngest executives in the jobbing trade heads one of oldest warehousing concerns in the United States, third largest in metropolitan New York.

AT the age of 17 he became shipping clerk, three years later a partner, and upon the death of his father assumed active charge at 24.

ACTIVE in association work, he was made president this year of the New York Iron and Steel association, a local jobbers' society.

WHEN an iron and steel jobbing concern 101 years old takes to itself another jobber aged 38 and becomes the third largest iron and steel warehouse company in the New York metropolitan district, the merger becomes unique in this day of amalgamations. But when the resultant company has at its head a man but 36 years old, it becomes increasingly evident that the day of the younger executive truly has arrived.

Such is the case with Egleston Bros. & Co. Inc., Long Island City, N. Y., organized more than 100 years ago, which recently absorbed Froment & Co., of Manhattan, the joined forces being headed by Alfred J. Bragg, born in 1894. One of the youngest major executives in the jobbing trade thus assumes increased responsibilities as the head of one of the oldest companies in the warehousing field in the United States.

About 17 years ago Mr. Bragg became affiliated with Egleston Bros. & Co., then owned by his father, Albert H. Bragg. He had just completed a post graduate course at the Mt. Vernon, N. Y., high school in 1913. He started in to learn the business from its foundation and became shipping clerk at $10 per week. He remained in that department for about two and a half years. He then entered the business office, where he discharged various duties and later became identified with the sales department.

In 1916, with his brother, Edward H. Bragg, he was taken into the partnership and upon the death of the father two years later, Albert H. Bragg at the age of 24 assumed active charge of the company. His young shoulders carried the increased responsibilities well and when the need for a new and substantially larger plant became increasingly evident, it was his decision that took it from its 92-year long occupied South street location in Manhattan to more commodious quarters in Long Island City.

Although Edward H. Bragg is not now actively engaged in the business, Mr. Bragg has associated with him another brother, James F. Bragg, treasurer of the company.

Long active in association work, this year he was made president of the New York Iron and Steel association, comprising the important jobbers of the metropolitan district.

HERBERT E. FIELD, appointed vice president of the recently-formed Continental Roll & Steel Foundry Co., Chicago, as noted in STEEL of July 31, has resigned to become manager of roll sales for Mesta Machine Co., Pittsburgh. Mr. Field, after graduating from college, was employed by Builders' Iron Foundry, Providence, R. I. He next was connected with Farrell Foundry & Machine Co., Ansonia, Conn., and then became associated with Mackintosh-Hemphill Co., Pittsburgh, for ten years. He resigned 15 years ago to become president of Wheeling Mold & Foundry Co., Wheeling, W. Va., and when this company was merged with others to form Continental Roll & Steel Foundry Co., he was elected vice president.

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Warren Maxwell, assistant superintendent, Dodge works, Link-Belt Co., Chicago, has been promoted to superintendent, to fill the vacancy caused by the death of F. J. Oakes. Mr. Maxwell was born in Rockville, Ind., in 1899 and obtained his schooling at Wabash college, Marion Military academy and was graduated from United States Naval academy, Annapolis. He became affiliated with Link-Belt sales department in 1922 and seven years later was made assistant superintendent.

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E. W. Kopke, former vice president and manager, Fulton Iron Works, St. Louis, has been elevated to the presidency, succeeding H. J.

Steinbreder, who was made chairman of the board. The board also elected Joseph W. Lewis vice president, and re-elected G. J. Kienzle secretary and treasurer. R. E. Adams was named assistant secretary and assistant treasurer, a new office.

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Richard Stevens, assistant mechanical engineer, has been appointed master mechanic to succeed Frank J. Kennedy.

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Clifford S. Stilwell has been appointed sales manager, Warner & Swasey Co., with headquarters at the home office in Cleveland. Mr. Stilwell has been associated with this company

Clifford S. Stilwell

since his graduation from Denison university in 1912, when he began as special apprentice in the works at Cleveland. Following two years as representative in the Chicago and Detroit offices he was made district manager in Detroit in 1915. He assumed his new duties Oct. 1.

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Arthur S. Cummings was recently made sales promotion and advertising manager for American Monorail Co., Cleveland.

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W. G. McFadden, identified with the Detroit sales office of the West Leechburg Steel Co., Pittsburgh, for about five years, has been appointed manager of that office, to succeed M. F. Findley, who recently was made general sales manager of the company.

William R. Kuhn has been transferred from Hartford, Conn., where he had been New England district manager, to Pittsburgh in charge of district sales there. He has been succeeded by R. J. Swan, recently assistant district manager at Chicago.

Norman H. Halls, formerly associated with the General Fireproofing Co. at St. Louis, has succeeded Mr. Swan at Chicago.

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Otto Becker has been appointed assistant superintendent, Mystic Iron Works, Everett, Mass., to succeed James H. Kennedy, resigned, as noted in STEEL, of Sept. 18.

Oscar R. Kroell has been appointed chief mechanical engineer, New England Fuel & Transportation Co., Boston, and Mystic Iron Works.

John Drewson has been appointed manager of New England Coal & Coke Co., Boston, New England Fuel & Transportation Co., and Mystic Iron Works.

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D. H. Miller, formerly with the sales department, Pittsburgh Crucible Steel Co., Pittsburgh, is now with Hausman & Wimmer Co., Pittsburgh, in charge of billet and slab sales.

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B. F. Mercer, general superintendent, Union Steel Casting Co., Pittsburgh, subsidiary of Blaw-Knox Co., has been elected vice president of the Union company.

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A. Backstrom has been placed in charge of the Seminole, Okla., branch shop, American Iron & Machine Works, Oklahoma City, Okla., to succeed V. R. Mattingly.

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A. S. Webb has been made secretary-treasurer, Specialty Tool Corp., Oklahoma City, Okla., manufacturer of oil field drilling equipment. He succeeds George Powers.

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F. H. Maloney, St. Louis manager, Truscon Steel Co., Youngstown, O., has resigned to become associated with the Campbell Industrial Window Co., New York.

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George E. Kincaid, works manager of the Oil Well Supply Co. at Oil City, Pa., has resigned. He has been succeeded by B. T. Enos, formerly assistant manager. Mr. Kincaid had been connected with the Oil Well company for 30 years.

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Charles C. Plummer, formerly Chicago district manager, R. H. Beaumont Co., Philadelphia, has become manager of the Chicago sales office of Bigelow-Liptak Corp., Detroit, manufacturer of suspended furnace walls and arches.

W. D. Dreiske, formerly affiliated with the Chicago office of Bigelow-Liptak Corp., has been transferred to Detroit as sales engineer.

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F. S. Macourek, for the past 13 years, secretary-treasurer, Vlchek Tool Co., Cleveland, resigned Oct. 1, to retire from active business.

E. C. Koster, vice president and factory manager, has been made executive vice president, D. B. Wilson, secretary, H. F. Vlchek, treasurer, and J. C. Wattleworth, formerly assistant factory manager, was made factory manager.

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C. S. Powers, formerly connected with the Detroit sales office, Republic Steel Corp., Youngstown, O., has been appointed district sales manager at Tulsa, Okla., in charge of the recently-established sales office. His territory will include Oklahoma and a portion of Kansas.

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G. S. Lovell, formerly representative at Kansas City, Mo., for J. A. Fay & Egan Co., Cincinnati, builder

Herbert E. Field

of wood working machinery, has has been appointed manager, Machine Tool & Supply Co., Tulsa, Okla. J. E. Manchester, former manager, has been made assistant to Mr. Lovell.

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Ray H. Morris, district manager for the past three years for Brace-Mueller-Huntley Inc., Rochester, N. Y., resigned Oct. 1 to become affiliated with the sales staff of Davenport Machine Tool Co. Inc., Rochester. His territory will include New York, southern New England and northern New Jersey.

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H. N. Haskell, formerly connected with American Bridge Co., and McClintic-Marshall Co., Pittsburgh, was appointed works manager Sept. 20, of the Ingalls plant, South Birmingham, Ala., of Ingalls Iron Works Co., Birmingham, Ala., structural fabricator. He succeeds the late J. E. Millar, whose death was noted in STEEL of Sept. 25.

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H. L. Maxwell, for the past four years associate professor of chemical engineering and research associate in

the engineering experiment station at Purdue university, has resigned to become research metallurgist with Du Pont Ammonia Corp., Wilmington, Del. While at Purdue Mr. Maxwell had charge of metallography and heat treatment courses. He also conducted a consulting practice in connection with corrosion resistant alloys, heat treatment of machine parts and specialized in welding problems.

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D. W. Ardiana, formerly connected with the Kay-Brunner Steel Products Co., Los Angeles, has been appointed representative for the Mechanical Pattern & Foundry Co. Inc., Los Angeles, to succeed F. J. Britts.

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Elmer D. Moak has been appointed general manager, Moak Machine & Tool Co., Port Huron, Mich., to succeed his father, the late Eugene H. Moak, who held that office since the company's inception.

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Harry B. Royer, an employe of the Steelton, Pa., plant of Bethlehem Steel Co., Bethlehem, Pa., for 20 years past, was on Sept. 20 appointed superintendent of transportation at Steelton to succeed the late J. H. McDonald, whose death was noted in STEEL of Oct. 2.

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Adolph A. Wagner, treasurer of the A. F. Wagner Architectural Iron Works, Milwaukee, has been elected vice president and general manager to fill the vacancy caused by the resignation of William F. Eichfeld. He is the son of Adolph F. Wagner, founder and president of the company. Mr. Eichfeld is establishing a new structural steel and ornamental iron plant with his son, W. Kenneth Eichfeld, under the name of William F. Eichfeld & Son Co.

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Wharton Clay, architectural and contracting engineer, has become affiliated with Truscon Steel Co., Youngstown, O. He will promote service, make contacts with larger projects involving building products, and will develop fields for the application of new merchandising ideas. He has been, successively, sales engineer, United States Gypsum Co., commissioner of the Associated Metal Lath Manufacturers, organizer of the National Council for Better Plastering, has contributed articles to business papers and has written several books on metal lath, plastering, etc.

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W. R. Cunnick, recently district manager at Detroit for the Weirton Steel Co., Weirton, W. Va., has been appointed general manager of sales of the consolidated strip and strip sheet departments with headquarters at Weirton.

L. T. Lott, recently assistant general manager of the strip steel department, has been made assistant to Mr. Cunnick, who has been succeeded at Detroit by A. C. Childs, former assistant manager there.

A. J. Holmes, formerly with Seneca Iron & Steel Co. and W. H. Davis, formerly with the Sharon Steel Hoop Co., both at Detroit, have been added to the Detroit office of the Weirton Steel Co.

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J. B. De Wolf, formerly assistant manager, tin plate division, Republic Steel Corp., Youngstown, O., has been appointed manager of sales, Philadelphia district. He succeeds C. E. McKinley, resigned.

C. A. Thayer has been appointed chief engineer, Republic Steel Corp., Youngstown, O. He has had a long experience with large steel and engineering companies, his most recent connection having been with Arthur G. McKee & Co., Cleveland, as chief engineer for their Russian steel works project. From 1920 until early this year Mr. Thayer was chief engineer, Gary, Ind., works, Illinois Steel Co., Chicago.

Obituaries

JOHN C. REED, 83, former plant manager and former general superintendent of foundries, Standard Sanitary Mfg. Co., Pittsburgh, now American Radiator & Standard Sanitary Corp., died Oct. 1 at his home in that city. Mr. Reed entered the foundry industry in 1883 when he went into the business for himself doing jobbing and stove foundry work. He began his connection with the Standard Sanitary company ten years later where he rose through many positions. He was also consulting engineer and a member of the board of directors. His son, Henry M. Reed, is president of the Standard Sanitary company.

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Sydney R. Russel, secretary, Russel Steel Construction Co. Detroit, was drowned in Lake St. Clair, Sept. 17.

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S. H. Wightman, vice president, Portland Concrete Machines Co., Chicago, died Oct. 2.

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William A. Johnson, sales manager, Pennsylvania Flexible Metallic Tubing Co., Philadelphia, died Oct. 4.

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Richard Hathaway Edmunds, 73, founder and editor of the *Manufacturers' Record*, Baltimore, died Oct. 4.

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William A. Porter, 70, secretary-treasurer, Wetter Numbering Machine Co., Brooklyn, N. Y., died recently.

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John Patton, treasurer, North Wales Foundry Co. Inc., North Wales, Pa., died Sept. 20.

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J. Will Johnson, 61, vice president, Pyle-National Co., Chicago, railroad equipment manufacturer, died Oct. 2.

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Herbert U. Durant, 58, for the past 15 years superintendent, Baker Iron Works, Los Angeles, died recently.

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J. S. McGinley, 59, international vice president, Amalgamated Association of Iron, Steel and Tin Workers, died Sept. 29 at Pittsburgh. He had been connected with the metal workers' association for 20 years.

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Edwin P. Moritz, 57, mechanical engineer, died at Scarsdale, N. Y., Sept. 29. Until about one year ago, Mr. Moritz, who was a native of St. Louis, was connected with the International Combustion Engineering Corp., New York.

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James H. Reed Jr., 46, president and director, American Die & Forge Co., Swissvale, Pa., died Oct. 4 at New York. He also was vice president and treasurer of the American Mine Equipment Co.

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Frederick Charles Thompson, 60 treasurer and manager of the Michigan Sprocket Chain Co., and a resident of Detroit for 35 years, died Sept. 29. He was associated with the Michigan Malleable Iron Co. before associating himself with the Michigan Sprocket Co.

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Raymond G. Bullock, 50, vice president and general manager, Olean Metal Cabinet Works Inc., Olean, N. Y., and former works manager of the Art Metal Construction Co., Jamestown, N. Y., died Oct. 3 at Baltimore. A new plant for the Olean company had been completed under his supervision a few weeks previously.

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Henry Lindahl 71, president and founder in 1895 of the Henry Lindahl Foundry & Machine Co., Cicero, Ill., died Sept. 30 at his home in Oak Park, Ill. He had been active in the affairs of his company until the day before his death. A native of Sweden, Mr. Lindahl came to this country when 11, and settled with his parents at Sycamore, Ill. After learning the machinists' trade, Mr. Lindahl located in Chicago in 1880, where for many years he was connected with machine shops and foundries.

Here and There in Industry

AUSTIN CO., Cleveland, architect, engineer and builder, has several industrial building contracts in hand through which several concerns are enlarging and bettering their plants. Ex-Cell-O Aircraft & Tool Corp., Detroit, has given the Austin Co. a contract for design and construction of a unit for the Continental Tool division at 5835 Martin avenue, Detroit, one story, 53 x 190 feet. The United States Tool & Mfg. Co., Detroit, has given Austin a contract for a plant in Dearborn, Mich., one and two stories, 100 x 200 feet, for the manufacture of precision tools. Mitchell & Smith Inc., Detroit, manufacturer of cork insulation, has contracted for a cooling plant unit, 46 x 120 feet. Other contracts include a laundry plant for the Pleasantville Ideal Laundry Inc., Pleasantville, N. Y.; display and storage building for the Contractors Machinery Exchange, Oakland, Calif.; woodworking plant, including heating, lighting and plumbing, 60 x 120 feet, for the Ideal School Supply Co., 8316 Birkhoff avenue, Chicago.

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Wrought Iron Co. of America has moved its New York offices from 393 Seventh avenue to 40 Rector street.

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Link-Belt Co., Chicago, has received a contract from the Interstate Iron Co., Virginia, Minn., for an iron ore screening plant.

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Morewood Sales Agency has opened an office at 1069 Division street, Portland, Oreg., to distribute electric welding equipment.

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Milwaukee Pole Line Co. plant, Birmingham, Ala., is rapidly nearing completion. Galvanized steel will be used when production gets under way.

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Fuller Lehigh Co., Fullerton, Pa., has moved its Cincinnati office from the Traction buiding to Carew Tower. H. E. Martin is manager.

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Napoleon Foundry Co, Napoleon, O., recently organized, has taken over the plant of the Keenan Furnace Co., and has started production of iron castings and patterns.

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Zanogen Steel Co. of Canada Ltd., Toronto, Ont., has been organized to handle the products of W. Fearnehough Ltd., Sheffield, Eng., manufacturer of machine knives and shear blades. The latter has a machine shop and precision grinding department in Toronto for finishing its products and these will be expanded.

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Morel Foundry Co., 533 West Spokane street, Seattle, has merged with the Schilling Iron & Bronze Co., 1200 Fourth avenue south. The firm specializes in aluminum and bronze work.

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Aluminum Co. of America, Pittsburgh, purchased an ageing oven and roller hearth furnace from the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., for installation at its plant at Alcoa, Tenn.

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Newark Wire Cloth Co., 351 Verona avenue, Newark, N. J., manufacturer of wire cloth for industrial purposes, announces manufacture of wire cloth of corrosion-resistant steel. This cloth is made in all meshes, widths and lengths, and can be made as fine as 200 x 200 (40,000 openings per square inch).

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Shawinigan Stainless Steel & Alloys Ltd., Montreal, Que., with foundry at Shawinigan Falls, Que., has begun the manufacture on a production basis of Nirosta metal castings which are heat and corrosion resistant. The company is a licensee of the Krupp Nirosta Co. Inc.

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American Foundry Co., Indianapolis, has nearly completed building its new plant following fire destruction of its former foundry and expects to resume production about Nov. 1, with full operation by Jan. 1. Eight buildings with 120,000 square feet of floor space make up the new plant, on a site of four acres.

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Union Foundry Co., Bellingham, Wash., has been organized to succeed the Union Iron Works, 1910 Grant street. The new firm is composed of John A. Hood, former head of the Union Iron Works, B. M. Wood and George Smith, formerly connected with the Lidgerwood Pacific Co., Tacoma, Wash.

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A. Taylor Steel & Wire Co., Philadelphia, has been organized by Arthur P. Goldsmith to operate a warehouse for the sale of wire fabric and other products. The warehouse and office have been established on D street near Erie avenue. The company is representative in the Philadelphia district for the Wickwire Spencer Steel Co. Inc.

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William F. Eichfeld & Son Co., Milwaukee, is being organized to fabricate structural steel, architectural and ornamental iron. It is headed by William F. Eichfeld, for many years vice president and general manager of the A. F. Wagner Architectural Iron Co., Milwaukee. W. Kenneth Eichfeld, his son, is associated with him.

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General Electric Co., Schenectady, N. Y., has plans made for an addition to its plant at Pittsfield, Mass., for the manufacture of transformer tanks. It will be 150 x 550 feet and 70 feet high and will be all-welded. Steel and glass on a concrete foundation will exclude all brick and timber. An extension 27 x 350 feet will be used for offices.

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Owen Bucket Co., Cleveland, has opened a branch office and warehouse at 36 Twenty-second street, Long Island City, N. Y., in charge of Frank W. S. Elmes. Buckets and parts will be kept in stock and service, including repairing, will be available. Opening of this office follows similar establishments at Chicago and Oakland, Calif. Fifty distributors also handle the Owen buckets.

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L. H. Zintgraff has established a sales office at 907 Security building, St. Louis, for the sale of castings, drop forgings and metal stampings. He has been appointed representative for the Steel Improvement & Forge Co., Cleveland; Globe Machine & Stamping Co., Cleveland; Farrel-Cheek Steel Foundry Co., Sandusky, O.; Terre Haute Malleable & Mfg. Co., Terre Haute, Ind.

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Pipe & Tube Products Corp., New York, with offices in the Woolworth building, has been formed by J. L. Sussman and R. K. Senter. The former was formerly president of Steel & Tubes Inc. and also the founder and president of Michigan Tube Co. until it merged with Elyria Iron & Steel Co., Elyria, O., Mr. Senter has been a dealer in nonferrous products in New York.

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Standard Sand & Machine Co., Cleveland, has moved its offices from 5151 St. Clair avenue, Cleveland, to 549 West Washington boulevard, Chicago. The company will be operated as a subsidiary of the National Engineering Co., but as a separate organization. It is planned to improve and further develop the company's sand mixer and to specialize in sand-handling, sand-preparing and mold-handling equipment.

F. o. b. PITTSBURGH

PITTSBURGH

STEEL mills are casting a critical eye upon operating costs, extra capacity having called for little attention for a number of months. A local engineer reports that never before have steel companies, particularly the smaller producers, been as active or as interested in the cost reduction work as they are at present. An inspection of finished steel prices, showing declines of as high as $10 a ton during the past 12 months, reveals the reason for this urgency. Mills which buy semifinished products have been doubly pinched by a smaller decline in prices of the former than of the latter.

Profits and wages are the beneficiaries of the attack upon costs, but the fact cannot be overlooked that in many cases reduced costs have been brought about through the introduction of machinery and equipment that have eliminated the services of a certain number of workers. Maintenance of wage rates in such cases is at the sacrifice of total wages for some employes.

Today, introduction of labor-saving equipment does not meet with the opposition that existed years ago when union labor was strong. This factor probably is responsible to a certain extent for the more active development of mechanical devices. One such machine now being built is a mechanical catcher for sheet mills that will eliminate the services of one or more men, depending upon the width of the sheet, in passing the material back to the roller.

Jones & Laughlin Spending $8,000,000 in Betterment

The Jones & Laughlin Steel Corp. has been most active of the steel companies in improving its plant in Pittsburgh proper, about $8,000,000 either having been expended during the past 12 months or scheduled for the immediate future. A new bar mill and power plant comprise the most important items of this program. An extension also is being added to the Hazelwood polishing mill.

Old beehive coke ovens in the Hazelwood district that were abandoned with the introduction of the by-product coke system will make way for the new bar mill. The latter will have an annual capacity of about 250,000 tons of bars annually in sizes ranging from 1 to 3 inches.

Most Steelmaking Capacity in Environs of Pittsburgh

When Jones & Laughlin built at Aliquippa, Pa., 20 miles down the Ohio river from Pittsburgh, it was thought by some that this move spelled the gradual elimination of the Pittsburgh works. Today, the local plant is rated at 2,000,000 tons annual ingot capacity compared with 1,420,000 tons for Aliquippa. The bulk of the steelmaking capacity of all companies in the Pittsburgh district, however, is located outside the city proper.

Carnegie's Duquesne plant, for example, is at Duquesne, Pa.; the Edgar Thomson works is at Braddock; and the Homestead works is at Munhall. The National works of National Tube Co. is located at McKeesport. All of these plants are less than 15 miles from the heart of the city but are outside Pittsburgh and her jurisdiction—an important reason why the city's population is only about 670,000, compared with 1,370,000 for the county itself.

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The freight rate question remains to be settled to the satisfaction of Pittsburgh industry and the railroads. Testimony of the carriers on the short haul subject, opposing a change in the increase which went into effect this spring on short shipments of iron and steel products, is due at this time. Steel producers and consumers are to have an opportunity for rebuttal after which the case is in the hands of the Pennsylvania public service commission for decision.

It is not thought that a final verdict will be rendered before the first of next year. The higher rates have been in effect since May 20, but if successful in reducing the charges the plaintiffs also will seek reimbursement for freight charges paid since that date.

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Both the railroads and steel companies are protesting the proposal of the interstate commerce commission to abolish all routes to the East that are more than 50 per cent circuitous of the most direct route. The latter between Pittsburgh and New York is via the Pennsylvania railroad, 442 miles. Among those that would be eliminated would be that of the New York Central over a more northerly course and the Erie through Buffalo. The Pennsylvania advantage on the Pittsburgh-New York haul, however, is reversed in the case of the Buffalo-New York route where the New York Central has a direct line.

Claim Railroads Get More from Coal Than Operators

Central and western Pennsylvania coal operators appeared at Washington last month to protest to the interstate commerce commission against existing rates on coal shipped to the East. This hearing followed unsuccessful attempts to induce the carriers to reduce rates voluntarily. It was pointed out in the testimony that the eastern railroads originated 346,000,000 tons of coal traffic last year.

This coal, at its destination, was worth $1,353,000,000 but the railroads charged $784,000,000 for carrying it, while the operators who dug it received only $569,000,000. Operators contend that the carriers receive a greater percentage of the value of coal than of any other article except

grapes, which are perishable in nature. On the longer hauls into New England from 70 to 80 per cent of the consumer's coal money goes to the railroads, it was charged.

The very unsatisfactory condition of the soft coal industry in western Pennsylvania, northern West Virginia and eastern Ohio during the past several years naturally has been aggravated by the 1930 business depression.

Coal prices have not suffered to the same extent as values of other commodities for the simple reason that they had been touching bottom levels for some time, but the tonnage involved has been restricted. In addition, the competition from southern producers, aided by the freight rate situation, has deprived northern operators of what they believe is their rightful market in the East.

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Southern mines can ship coal several hundred miles to tidewater over a longer distance than most of Pennsylvania to New England, thence to New England by water for the same amount or less for which Pennsylvania coal can be shipped. Coal from the Big Sandy district, eastern Kentucky, for example, is carried 1238 miles to Boston for $3.47 a ton, while the charge from the Westmoreland district, southwestern Pennsylvania, is $4.47 for a haul of 648 miles.

Eastern coal consuming interests, including the Lehigh Portland Cement Co. and the Bethlehem Steel Co., are joining northern coal operators in this fight, while southern producers are lining up on the side of the railroads in opposing any reduction in present rates.

Spending Millions for Coal-Cleaning Equipment

One of the most important developments in coal producing methods during recent years has been the introduction of mechanical cleaning equipment. The Pittsburgh Coal Co. now operates three plants employing the wet process and one using air cleaning and cleans about 65 per cent of all coal sold. Carnegie Steel Co. recently contracted for a $2,000,000 coal washing plant at the Clairton by-product coke works. The plant will have a washing capacity of 12,000 tons daily.

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Considerable public work for which funds are available is pending in Allegheny county. About $25,000,000 is involved, although it is doubtful if the two major projects, a town hall and downtown subway involving $12,000,000, will get under way for many months.

Of chief interest to steel producers are three bridge jobs involving $6,275,000. Bids are being asked on the $3,450,000 West End-North Side bridge over the Ohio river and the $1,925,000 structure to be built over the Monongahela river at South Tenth street.

Building has been slow in Pittsburgh this year as has been the case in most other cities. August permits were the fifth highest for any month since 1924, principally because of the inclusion of the $4,000,000 Gulf Refining Co. office building project in that month's total. Activities of the Gulf company this year have added considerable steel tonnage to books of Pittsburgh steel producers.

Gulf Refining Projects Taking Much Steel

The Gulf skyscraper is taking more than 12,000 tons of shapes, piling and concrete bars. An oil line to be laid from Texas to Pittsburgh will require about 100,000 tons of pipe, while about 15,500 tons of plates have been placed so far for tank work in connection with the pipe line and refinery construction. The Gulf company also is buying barges for transportation of petroleum products, a tentative inquiry calling for six barges requiring 1500 tons of steel.

This inquiry represents practically the sole active project in the barge market. It has been estimated that about 150 barges are in prospect based on requirements of river fleet operators, but there appears no urgency to close on equipment. The poor demand this year for most barge builders is expected to result in good activity with the improvement in general business due to the release of orders held up for a number of months.

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Possible cessation of navigation on the Monongahela river has been averted through an agreement reached by the federal government and the West Penn Power Co. whereby the latter has agreed to place the 18,900,000,000 gallons in its Lake Lynn reservoir in Cheat River, W. Va., at the former's disposal. In return the power company will receive from the Duquesne Light Co. any and all power it needs for its clients.

The drought this year lowered several pool stages on the river to the point where a holdup on shipping was threatened. The particular section seriously affected is the 34-mile stretch from Brownsville to Point Marion through which is moved a large coal tonnage for consumption by Pittsburgh district steel companies.

Coal comprises the leading commodity in the Monongahela river freight shipments, amounting to 23,182,128 tons last year. Failure of navigation on the Monongahela also would affect shipments down the Ohio, inconveniencing steel companies as far down stream as those in the Wheeling, W. Va., area. It is planned to replenish the low pools as often as needed to keep the river at its navigation level. The three pools berecently were from ½-foot to more than 3½ feet below the crests of their dams.

The drought indirectly has affected river transportation through the damage to boilers of steamers occasioned by the sluggish streams. The low water contains a greater percentage of acid than usual and attacks boiler tubes.

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Pittsburgh recently was given a view of the river shipping facilities that shortly will be available between Cincinnati and New Orleans when the Ohio, a towboat representing the latest development in inland river craft, was taken on a short trial trip down the Ohio with a tow of barges. This boat and a sister steamer in addition to a fleet of steel cargo barges were built by the Dravo Contracting Co. here for the Mississippi Valley Barge Line Co., St. Louis. Two similar boats are being built by the Charles Ward Engineering Works, Charleston, W. Va.

The venture of the Mississippi Valley company is something of a departure from present river transportation in that fast service will be offered in the movement of packet freight in small special type barges that permit rapid coupling and disengagement at various points along the route. This eliminates the necessity of delaying the entire tow in order to unload portions of larger barges, as in former practice.

The powerful 2000-horsepower steamers will travel 10 to 15 miles an hour under light loads and will accommodate 20 to 30 barges on hauls where speed is not an important consideration. It is possible that this service may be extended up the Ohio to Pittsburgh but at present the route will be between New Orleans and Cincinnati where a new $500,000 terminal has been erected by the Mississippi Valley Barge Line Co.

Pittsburgh Hoping for Fair October Market

Steel officials in the Pittsburgh district maintain a hopeful attitude regarding business. September brought a mild recovery in a number of steel products, and although the upturn lacked the vigor that had been hoped for, progressive improvement of a gradual degree is anticipated for the next 30 days.

The lethargy in the automotive industry has been a disappointment, but despite the fact that September tonnage of flat rolled steel products from motor car builders was at practically the lowest level of the year, bookings of sheets and strip showed a gain over those of August.

Consumer interest in future needs displayed considerably more life last

(*Concluded on Page* 104)

EDITORIAL

World Wants Work Not Leisure

WITH 15,000,000 men or more in Europe, Russia, Great Britain and the United States wanting to return to work, and their employers anxious to have them, some beautiful theories that flourish in the hey-day of prosperity are swept into the discard. The most common of these is that cheap and abundant power, to be taken from the earth, the sea or the air, will free men from the necessity of work and permit them to support themselves in comparative idleness and luxury.

The late Earl of Birkenhead, former lord chancellor of England, in a book completed shortly before his death, predicted a workless Utopia in a hundred years, through the release of atomic energy and other scientific steps.

"No man," he declared, "will grudge the one or two days a week he passes at work in a factory when he considers that as its reward it brings him five or six days of freedom."

Here is a concept of work that has been rapidly gaining with every scientific congress and the dissemination of news of new marvels. There never was a time when power was so available and so easily applied as it is today; yet there probably is more involuntary unemployment today than ever before in modern times, and every industrial country on the globe is striving by all the means at its command to provide work for its idle men.

Idleness Not Ultimate Need of Man; Labor Is Human Necessity

It must seem grotesque to those unfortunate ones in England to be told at this time by one of their most successful leaders that there is enough energy in a drop of oil to propel a LEVIATHAN across the Atlantic; that there are 10,000,000 horsepower-hours in one drop of water, and that in a few generations there will be no need for their descendants to work.

They know that there are countless units of heat and horsepower in the coal under their feet, immediately available without the need of any scientific legerdemain to release it, though the unemployment in England is most severe in the very spot where the coal is to be mined. How they wish there was some way of releasing that storehouse of energy to provide themselves with means of sustenance, comforts and luxuries!

Power by itself will not free men from work; the most and the best that can be expected of it is that rightly used it will save them from slavery and elevate them to the privileges and opportunities of using their own physical and mental energies normally to better advantage. The Puritan idea of work as a blessing is more in line with natural law than is the dream of serene idleness. The experiences of the people in America and India have proved this many times.

Britain, not waiting for the day when power, theoretically, will set all its people free, is striving diligently to find work for them. It is reversing its traditional free trade policy; it wants its industries to revive, to use more power, thus giving 2,500,000 who are idle an opportunity to earn their daily bread, without the aid of doles from the government.

Only Opportunity for Work Can Prevent Business Depressions

The banker, who addressing the American Bankers' association in Cleveland last week declared that the American standard of living is too high for the good of the nation, probably was impressed with the desirability of hard work, instead of leisure. He represents the extreme reactionary opinion, which is not shared by the majority of bankers or industrial leaders. President Hoover expressed the nation's thought when he said that technical progress must not and should not be stopped, and:

"Science girds itself with painstaking research to find the nature and origin of disease and to devise methods for its prevention. That should be our attitude toward these economic pestilences. They are not dispensations of providence. I am confident in the faith that their control, so far as the causes lie within our own boundaries, is within the genius of modern business."

Every recurring depression teaches that it is not leisure that is wanted, but a fair and reasonable amount of work. The American people have been at work for 150 years raising and improving their standard of living, and will continue to do so. Thus far technical progress has created new opportunities as rapidly as it has removed the necessity for the hardest tasks of manual labor. The difficult problem of the future will be to utilize energy to keep men busy, rather than to free them from all work.

Severity of Present Recession Mild Compared To That of Post War Depression

National Industrial Conference Board, in Study of Features of Business Situation Now and 10 Years Ago, Finds Conditions Today Much Brighter Than in War Deflation Period

ONE dependable ray of hope has appeared on the otherwise gloomy horizon of business. Statisticians of the National Industrial Conference Board have prepared a study of business factors by which the period of general depression of ten years ago is compared with the present situation, with the result that a considerable degree of encouragement is extended to the business interests of the country. The comparisons appear in a bulletin just published on "The Current Business Depression."

Changes Not So Pronounced in 1930 As in 1920 Period

The period of 1919-1921 is compared with that of 1926-30. The fact is demonstrated that the business pendulum does not swing through a perfect arc. The greater part of the decline from the preceding maximum, during each of these two periods, occurred within a few months. Dullness then ensued, and when the upward swing began it was by no means a counterpart of the decline but a very slow and gradual climb. This fact suggests that in the months since July, 1929, we may have passed through the greater part of the decline and have about reached the low level to be expected in the present depression.

"One thing stands out very clearly," says the Conference board. "In none of the factors pictured was the change so great in 1930 as in the earlier period. Whatever the antecedent inflation before the recent drop, it was far from being so extreme as in the unusual conditions which preceded the drop in 1920. As the present depression is less severe, there is good ground for hope that it will not be so prolonged as that of ten years ago."

The report declares that the present business situation baffles exact understanding and proceeds to a discussion of the psychology involved:

"It cannot be denied that there is an undercurrent of feeling in the business world that the situation is worse than the newspapers seem willing to admit. This is in part a reaction against the fictitious optimism which, in the beginning of the decline, was sponsored by high authorities, both public and private. Many who register and interpret the facts of business are ever holding out rays of hope that the worst is over, that things will soon begin to mend, and that prosperity is at our doors waiting only for us to open them and bid it enter. Never before has there been such loud and boisterous whistling as we have passed through the dark lane of business decline. Editors and speakers have been encouraged to equip themselves with rose-colored spectacles and to give to all their utterances a joyous tone. It may be that at one time this well-organized cheerfulness materially lightened the burden, or at least diverted the minds of the people from the load they had to bear, but it is probable that any such effect has long since been spent and that today the depression of spirit not only corresponds to the depression of business but often exceeds it.

Whispering Campaign Detrimental To Good Business Sentiment

"Along with this official campaign of optimism and partly stimulated by the distress of public utterances, there has gone a whispering campaign of quite a different character. Where business men congregate together they hear from one another tales of woe which make them view the situation darkly. They hear of a given concern whose product has been cut in half, of another perhaps that is working only half time, of a third that has laid off twenty per cent of its men, and perhaps a fourth that

has made a ten per cent cut in wages. Out of this scattered evidence they unconsciously tend to form in their minds a picture of a situation in which plants generally have only half of their accustomed output, afford to labor only one half of the usual opportunity, have permanently reduced working forces in large measure, and have cut wages generally.

"If one turns to the picture which trustworthy recorded statistics unfold, one finds that it is neither so hopeful as that of the wholesale dealers in optimism nor so despairing as that of the retailers of pessimism."

Industrial Corporations Are in Good Liquid Financial Condition

A STUDY of published balance sheets of 210 industrial corporations discloses a generally more liquid position at June 30, 1930, than at June 30, 1929. Cash and marketable securities show a moderate reduction, and inventories also decreased in dollar value. Net working capital decreased relatively less, but the ratio of current assets to current liabilities noticeably improved, compared with a year earlier. These facts are brought out in a bulletin issued by Ernst & Ernst.

Comparative figures for the entire group of 210 companies are as follows:

	June, 1930	June, 1929	Decrease
	(Thousands)		Per cent
Cash and securities	$ 830,879	$ 865,373	3.99
inventories	1,425,727	1,524,852	6.50
Total current assets	3,004,150	3,230,297	7.00
Current liabilities	560,613	709,706	21.01
Net working capital	2,443,536	2,520,590	3.06
Ratio current assets to current liabilities	5.36:1	4.55:1	

Inventories constituted 58.35 per cent of the companies' net working capital at the close of June, 1930, as compared with 60.50 per cent one year earlier. The automobile group accounted for approximately 19.35 per cent of the aggregate inventory valuation for all companies tabulated in 1930, and 24.12 per cent of the total in 1929. Excluding this group, the remaining 200 companies showed a decline in inventories of less than 1 per cent as between June, 1929, and June, 1930.

Considering the progressive decline in commodity prices during the period, this study would tend to indicate that in most lines there has been little, if any, reduction in the volume of physical inventories at the middle of 1930, compared with midyear of 1929. Certain exceptions probably should be made, in the case of such industries as automobile manufacturers, textiles, railroad equipment, household equipment, and possibly one or two others, where reductions in inventory values have been so substantial as to indicate the probability of a reduction in physical volume as well.

Courage Won in Past Depressions; Will Win in This One

THAT American business climbs out of depression with courage and learns its lessons from experiences of the past was emphasized in an address before the annual meeting of the American Bankers' association by Alexander D. Noyes, financial editor, *New York Times*. Speaking on "The Cycle of Prosperity," Mr. Noyes said:

"What changed the United States of 1878 from an 'importing country' into a community whose great export surplus cut down its foreign debt and made resumption of species payments possible? Financial history will tell you that it was the lowering of inflated prices, the application of new energy and economy to home production, which reversed our world position and that these processes rose directly out of the panic of 1873 and the hard times of the next four years.

"What brought about the American revival of 1898 and 1900, when our manufacturers for the first time captured the markets of the world? The answer is, our producers and wage earners had learned the lessons taught by the panic of 1893 and by the grinding trade depression of 1894 and had outstripped Europe in the race for economical manufacture.

"What caused the famous outburst of American prosperity in 1925, when our markets of 1921 and 1922 had been talking of industrial ruin from the crash in staple prices and the nation-wide 'frozen credits'?

"Does anyone question for a moment that those bitter experiences of deflation days were the direct and immediate occasion?

"We are about to enter now on another and precisely similar chapter of experience. Let us not overlook the fact that, in all these previous epochs of revival, our industrial achievement was not based merely on application of new and aggressive methods, but on courageous recognition of fallacies and blunders.

"When we may look for the new chapter of prosperity, how long the present atmosphere of gloom and discouragement will last, is a question for the prophets. Yet the change from such a situation has in our past almost invariably come with suddenness; it has usually come when the spirit of pessimism was almost at its worst."

THE BUSINESS TREND

1930	
Oct.	$10.30
Sept.	10.43
Aug.	10.45
July	10.56
June	10.77
May	10.94

1929	
Oct.	$13.70
Sept.	12.67
Aug.	12.63
July	12.49
June	12.46
May	12.68

Business Moving Forward At Slower Pace

WITH September in the background and the final quarter one week old, American business finds itself steadfastly battling for improvement, but making slow progress. Six weeks ago, when activity stood at low ebb, optimists and pessimists alike were in agreement that September would witness an upturn. But September has come and gone, and while it brought some slight gains, the improvement was much less than expected by the majority of industrial leaders.

It is doubtful whether the indices of industrial production for September will show a gain over August. Operations in the steel industry were slightly increased during the month, the rate at one time mounting to 60 per cent of capacity. However, other important industries, including the automotive, failed to show any improvement over August's poor position. Car loadings, which are indicative of industrial activity, gained in a promising manner after the Labor day interruption, but in the third week of the month they dropped again. The general situation at the end of the month was somewhat uncertain, due to doubt as to whether the small gains of mid-September could be maintained.

Absence of Spectacular Improvement Proves Disappointing

Fortunately this uncertainty is grounded on nothing more alarming than a slight slackening in the pace of business recovery. Many business observers have maintained right along that progress would be marked by alternative advances and relapses. Too much importance should not be attached to the present apparent let-up in activity.

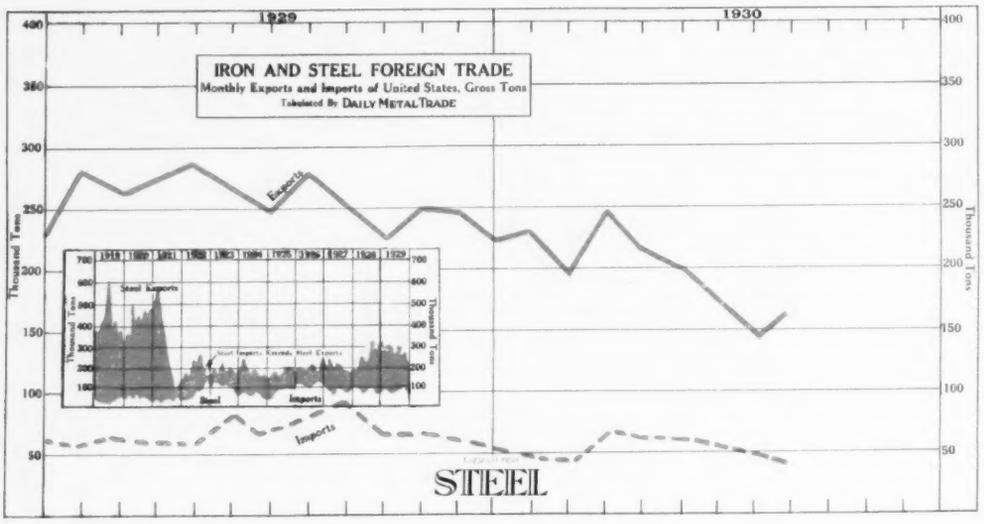
Commodity prices continue to hold a key position in the business situation. Several of the well known price indices turned upward six weeks ago, while others have continued to swing lower or to remain practically stationary. Within the past few weeks a number of the indices which had turned upward dropped slightly, indicating that the trend of prices is not yet firmly established. These irregularities seem to be viewed with concern by many business leaders who feel that a definite firming tendency in commodity prices would stimulate buying and help to break the present attitude of watchful waiting.

Current Trend in Commodity Prices Marked by Irregularities

However, while the price situation is shrouded in doubt, the signs for early clarity are more promising. Bradstreet's index for Oct. 1 stood at $10.30 as compared with $10.43 Sept. 1 and $10.45 on Aug. 1.

STEEL's composite of 14 iron and steel products still is drifting downward, due primarily to belated softness in pig iron. On the other hand, prices of finished steel are firming in what appears to be a good bid for stabilization. STEEL's composite stood at $32.52 on Oct. 1 as compared with $32.56, the average for all of September. Iron and steel prices now are approaching the critical period of the present test. If quotations for finished steel remain steady at or near present levels and if the deflating of pig iron now in progress is completed promptly, the stage will be set for a clear-cut determination of future price policy.

Business is trying hard to hold what it has gained. Right now there is a slackening in the rate of recovery. This is not unexpected.



Exports

	Tons
Aug., 1930	151,235
July, 1930	131,771
Aug., 1929	242,856

Imports

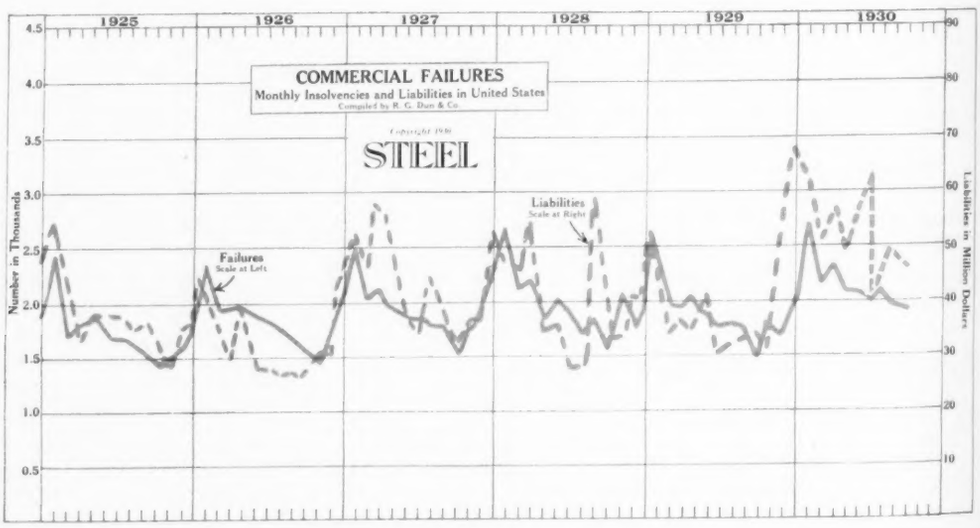
Aug., 1930	35,387
July, 1930	39,700
Aug., 1929	83,969

Steel and Iron Exports Gain Sharply; Imports Lower in August

America's foreign trade for August, reported in these columns two weeks ago, was surprising in many respects, but not more so than the figures on iron and steel imports and exports just released by the department of commerce. Exports in August rose to 151,235 tons from 131,772 in July, while imports dropped from 39,700 in July to 35,387 tons in August. The increase in exports interrupts a steady decline from a peak of 238,333 tons in March, the highest point attained in 1930. It will be noted that the excess of exports over imports has been diminishing since early in 1929.

Business Failures in September Gain, But Liabilities Are Less

Commercial failures during September rose slightly to 1963, according to the compilation of R. G. Dun & Co. This compares with 1913 in August and 2028 in July and represents an increase of 2.6 per cent over the August total. At the same time the liabilities dropped 4.5 per cent to a total of $46,947,021, compared with $49,180,000 in August and $39,830,000 in July. At this time last year failures were at about 1600 per month and liabilities at about $33,000,000. The number of business failures has been decreasing rather steadily since January, with the total hovering around 2000 since May.

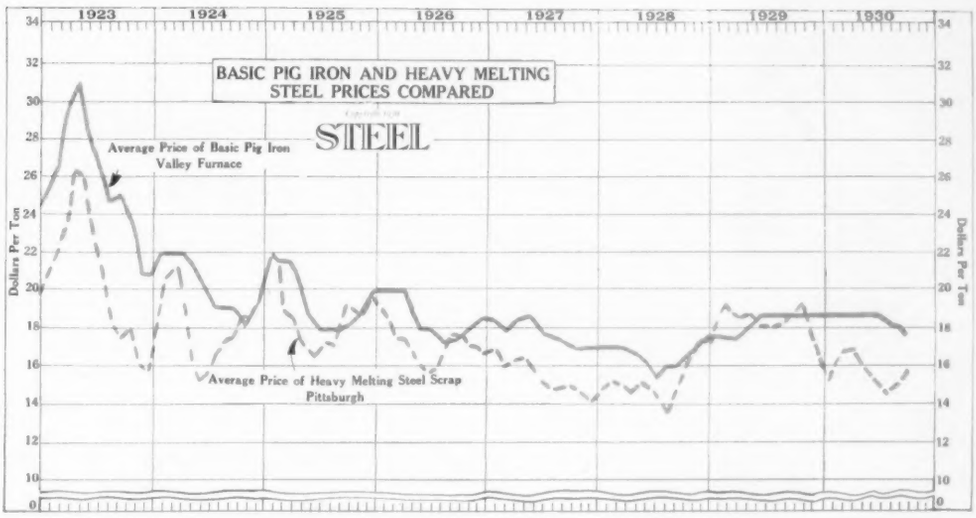


Liabilities

Sept., 1930	$46,947,021
Aug., 1930	49,130,000
Sept., 1929	34,120,000

Number

Sept., 1930	1,963
Aug., 1930	1,913
Sept., 1929	1,563



Basic Pig Iron

	1930	1929
Sept.	$17.75	$18.50
Aug.	18.00	18.50
July	18.20	18.50
June	18.50	18.50

Heavy Melting Steel

Sept.	$15.70	$18.45
Aug.	15.19	18.90
July	14.90	18.45
June	15.10	18.30

Basic Pig Iron Quotations Lower; Steel Scrap Higher in September

The relation between basic pig iron and heavy melting steel changed again in September, according to the monthly averages of basic iron, valley furnace, and heavy melting steel scrap, Pittsburgh, compiled by STEEL. Basic iron, which stood at $18.50 for many months and declined in August to $18, slipped further to $17.75 in September. At the same time, heavy scrap, which had turned upward in August again gained in September, the average for that month being $15.70, as compared with $15.19 in August. Recent declines in pig iron are considered as belated adjustments caused by competition in certain market centers. Scrap is more uncertain than it was a few weeks ago.

Prices of Steel Bars and Basic Iron Decline; Steel Is Steadier

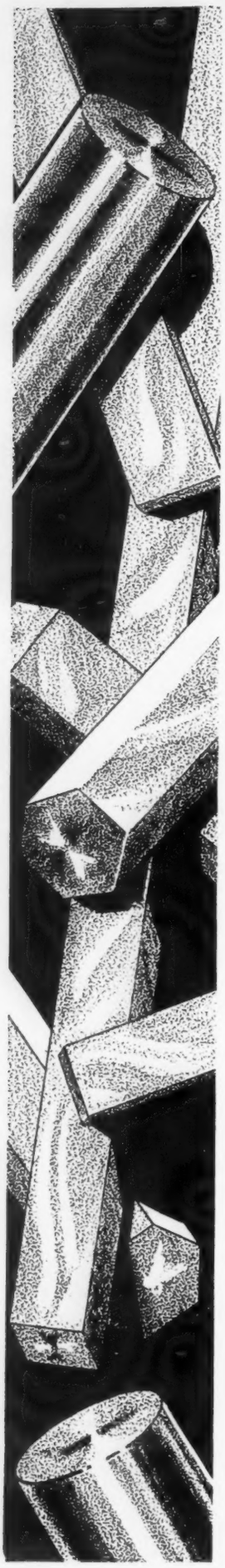
During the first week of October, steel prices exhibited more firmness than those of pig iron. Nevertheless the averages for steel bars and basic pig iron for September, as compiled by STEEL, showed declines from the August averages. Quotations for steel bars, Pittsburgh base, declined from $34 in July and $33 in August to $32 in September. Some authorities believe there is sufficient resistance to further softness to prevent appreciable declines in October. Belated adjustments carried the average for basic iron, valley furnace, from $18 in August to $17.75 in September. At present it appears as if stabilization will be reached in steel before it appears in pig iron prices.

Steel Bars

	1930	1929
Sept.	$32.00	$39.00
Aug.	33.00	39.00
July	34.00	39.00
June	35.00	39.00

Basic Pig Iron

Sept.	$17.75	$18.00
Aug.	18.00	18.50
July	18.20	18.50
June	18.50	18.50



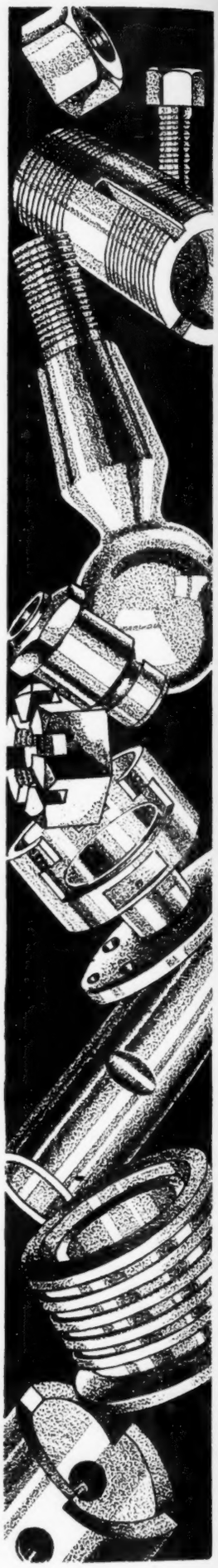
This is Number Eight of a Series of Advertisements

THE COLD FINISHED STEEL BAR INDUSTRY DELIVERS PRECISION AND PERFECTION

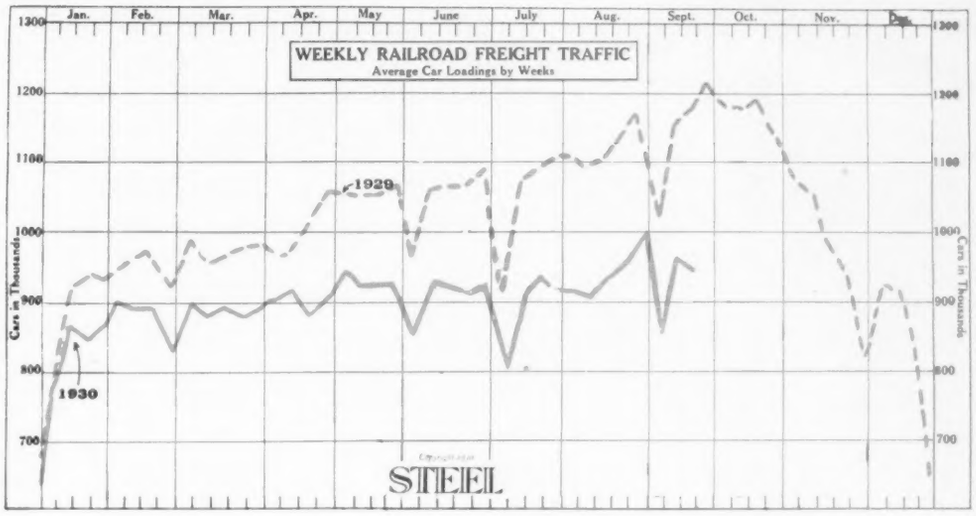
Quicker deliveries — better machinability—uniform quality—uninterrupted production —undivided responsibility—these are the reasons that hard-headed manufacturers, with an eye on profits, use COLD FINISHED STEEL BARS. Their decisions are influenced, perhaps, by the expressed preference of the manufacturer of automatic screw machines, as well as the operators, for the use of "cold drawn" steel in their machines to attain the best results. The lessons of time, the teachings of experience, all point to the same conclusion.

"The Rapid Duplication of Machined Steel Parts at Lowest Cost Continues to Depend Upon That Perfection and Precision Which Only the Cold Finishing Processes Can Give"

THE COLD FINISHED STEEL BAR INDUSTRY



1930	
Sept. 20	952,512
Sept. 13	965,713
Sept. 6	856,637
August 30	984,504
August 23	940,549
1929	
Sept. 20	1,166,330
Sept. 13	1,153,062
Sept. 6	1,018,481
August 30	1,162,100
August 23	1,137,966

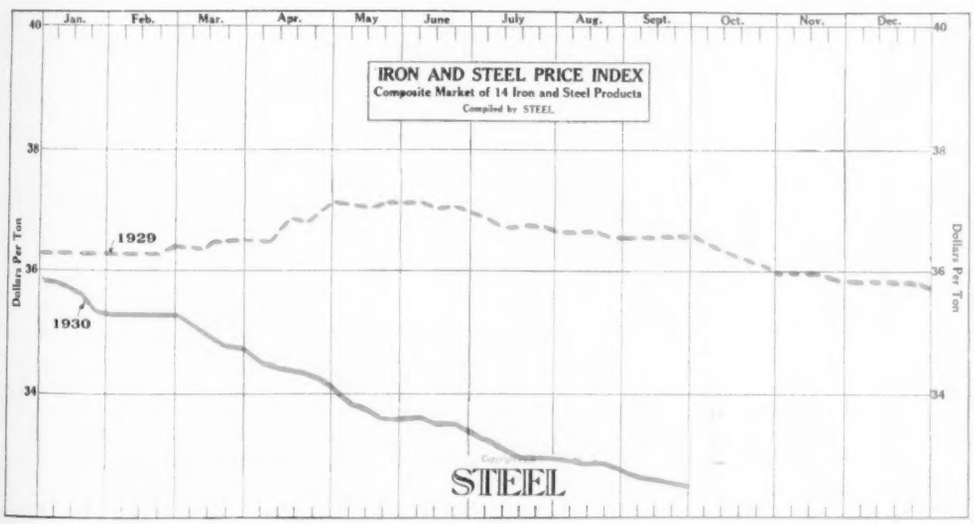


Car Loadings of Revenue Freight Drop; Decline Less Than Estimated

After recovering nicely from the Labor day week-end of inactivity, loadings of revenue freight dropped slightly in the week ending Sept. 20 to 952,512 cars. This downward trend at this stage of the month is contrary to the tendency a year ago, when loadings climbed steadily from Labor day to a peak in the first week of October. While the freight volume for the week of Sept. 20 is disappointing in view of experience in 1929, it is considerably above the preliminary estimate for that week, which was 945,000 cars, according to the car service division of the American Railway association. The freight volume of the next few weeks will be watched with interest.

Composite of Prices Sags Due To Adjustments in Pig Iron

Quotations of steel and iron products have not yet reached the stage of stabilization which is necessary before STEEL's composite of 14 steel and iron commodities may be expected to turn upward. The composite stood at $32.52 as of Oct. 1, after sliding down gradually from an average of $32.65 for the month of September. Recent declines have been caused primarily by adjustments in pig iron prices. Steel quotations have stiffened appreciably and have not contributed to the downward trend of the composite for several weeks. The index is 10 per cent below last year's figure and is less than half of the corresponding price for October, 1920.


IRON AND STEEL PRICE INDEX
Composite Market of 14 Iron and Steel Products
Compiled by STEEL
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1929
1930
Dollars Per Ton
STEEL

Weekly Figures	
Oct. 1	$32.52
Sept. 24	32.56
Sept. 17	32.64
Sept. 10	32.68
Sept. 3	32.78
August 27	32.88
Monthly Averages	
September, 1930	$32.65
August, 1930	32.99
July, 1930	33.21
June, 1930	33.53
August, 1929	36.54

THE YEARBOOK ISSUE

JANUARY 1, 1931

An Institution throughout the entire Steel Industry ⁘ ⁘ PRODUCTION · PROCESSING DISTRIBUTION · · · USE.

Use enough space to tell the complete story of your product or service · · Make this the Master advertisement of the year.

Forms start to press Dec. 15th. Copy due Dec. 1st.

Old enough to know the great traditions of steel

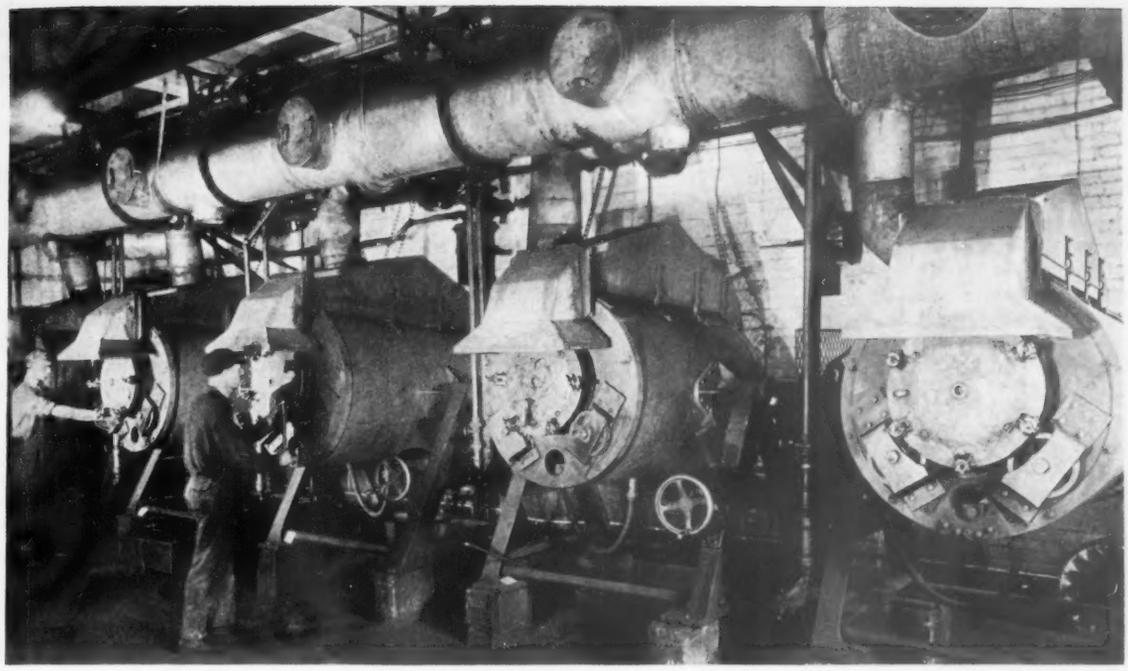
STEEL

A PENTON PUBLICATION

Cleveland

Young enough to lead the industry in a modern age.

NEW YORK · PITTSBURGH · CHICAGO · SAN FRANCISCO · LONDON



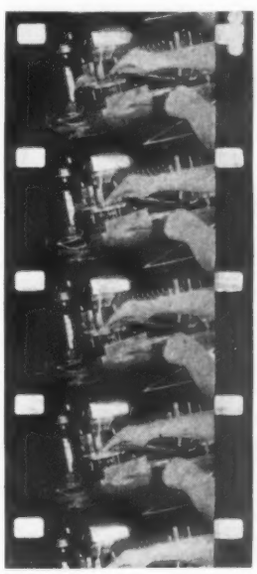
A battery of rotary carburizing furnaces used to treat the camera parts

Motion Pictures Are Finding Use in Training Mechanics

BY J. B. NEALEY

LONG involved directions given to a mechanic to instruct him in the performance of some intricate operation never has constituted, even at its best a satisfactory or economic system of teaching. This fact has been emphasized particularly in cases where the mechanic came from a foreign land, or previously was employed by some company in one of its plants located in a foreign country.

Imitation has been one of the simplest methods of teaching a person to perform a task. To make use of this method and to combat the difficulty of involved directions, the motion picture now is being used in industry to portray these details graphically and to supplement written and oral specifications. Experience has shown that a motion picture will convey the procedure of doing a job more quickly and completely than will a typewritten or verbal instruction. Therefore, films can be used advantageously to accompany engineering specifications covering blue prints of tools and materials, feed, speeds and similar data of importance to the mechanic. One of the pioneers in the use of motion pictures in this field, as well as manufacturers of the equipment used is the Eastman Kodak Co., Rochester, N. Y. This company recently has been extending its plant facilties in foreign countries for the manufacture of cameras, film, and other photographic equipment. In tooling these plants for production, special written specifications and instructions were prepared for each operation involved.

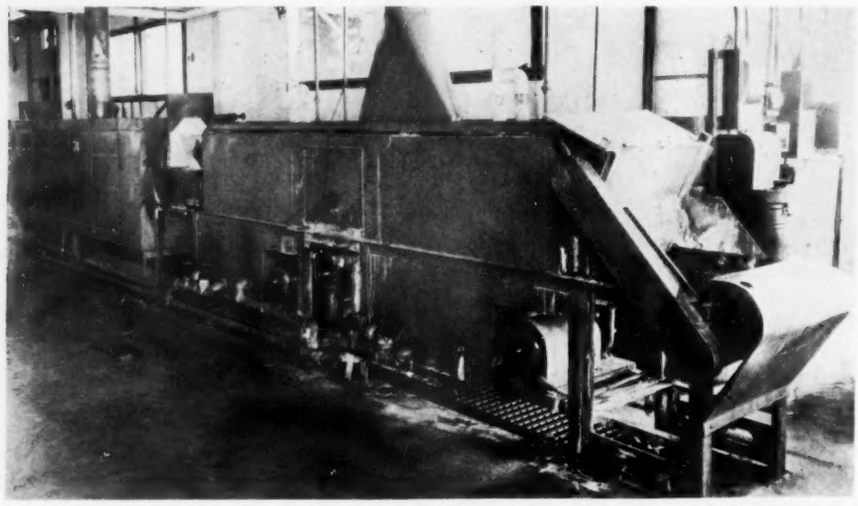


Section of film used to instruct mechanics in manufacturing methods for camera parts

However for international use, it was found that such special instructions and specifications were of limited value. Difficulties occurred through the lack of exact equivalents in translation and especially with technical shop terminology, and it was found advisable to make motion pictures of each machine while in operation. One long film was used

for a number of machines, and suitable captions were interspersed to identify the several different operations with the written specifications already mentioned. This film projected in the foreign plants gave the foremen and operators an immediate and a comprehensive grasp, not only of the equipment and general method of manufacture, but also of the essential details, thereby proving an invaluable aid.

In general, the plan used in these pictures was to show first a title which identified the operation and



Continuous washer and dryer where a solution of caustic at 160 degrees Fahr. is used to rinse the parts

"keyed it" into the written specification, following up with a "close-up" of the material or part before and after the operation. Next a title was used to give briefly the material and equipment data. A long shot of the operation cycle was then given to show the arrangement and layout, concluding with a close-up of the principal cycle to show the details.

Visual Instruction Valuable

Manufacture of the 16-millimeter reels for the new small size movie camera will serve to show how this idea is carried out, and it requires little imagination to grasp the great value of visual instruction through motion pictures in contrast with the difficulty of getting a quick and comprehensive grasp of all these details as covered by the following description:

"The side disks or flanges are made from aluminum blanks. The first operation is to trim to size and perforate the round or square hole in the center. This is performed on a punch press, the seated operator filling a tray on the front of the press from the original packing case and feeding from the tray."

Additional information of value on this operation is that air blows the trimmed and perforated blank through a chute into a tote box at the rear of the press while the scrap is blown into a box at the left of the press. The presses in this division are all equipped with non-repeat mechanisms and guards which swing across in front of the dies when the press is tripped to push operators hands away should they be a little slow at any time. The non-repeating device consists of a safety clutch which will not alloy the press to repeat no matter how long the treadle is held down.

The next operation is to stamp and pierce the flange, the blanks being placed in tote boxes on high lift trucks to the left of the press, while the finished blanks are blown through a chute into tote boxes at the rear. Then the flanges are burred and embossed.

The hub is blanked in an inclinable press. The material is the same as for the flanges with gray finish except that it comes in flat sheets 1 11/16-inches by 74 inches, 28 sheets making 1000 pieces. The operator feeds the press from the original packing cases, and disposes of scrap to the floor on the left, while the blanked pieces drop through the press into trays placed on the floor.

Hub Formed on Punch Press

The hub is formed in two operations on a punch press. The formed pieces, after the first operation, being blown into trays at the rear of the press through a chute from which they are picked up and taken to another press for the second forming operation.

Washing consists of putting the parts through a combination washer and dryer of sheet steel about 30 feet long and 3 feet wide. It is divided into three parts, washing, rinsing and drying. The drying compartment is heated with gas burners and the whole is equipped with a traveling chain conveyor which protrudes from either end to form loading and unloading tables. Another chain type conveyor runs parallel and close to the main conveyor in the washing compartment and the parts are held between the two to keep them from being knocked about by the sprays.

A solution of caustic soda, 2½ pounds to 50 gallons of water at 160 degrees Fahr. is pumped through nozzles to form the sprays. Clean water at 150 degrees Fahr. is used for rinsing. Jets of air from perforated pipes blow off excess water and six burners keep the drying section at 450 degrees Fahr. For the tops and bottoms of the reels a solution of sodium cyanide is used as a rinse.

Assemblies Performed Manually

The bench assemblies of one flange to each hub is performed manually at a bench by a girl operator. The hub and flanges are sprayed with a special black paint, specially developed for the purpose. Next the inside of the round hole flanges are sprayed. In this operation, a spray hood outfit equipped for two girls is provided which includes gun-type sprayers, trays, masks, etc. The air pressure for the spray is 75 to 80 pounds and the 5-gallon tank is under a pressure of 25 to 30 pounds. The hoods are provided with gages showing pressures from the tank and spray lines. The operator secures a hub and flange from the tray, adjusts his mask, sprays the flanges and disposes of them on a tray which is on a portable bench at the side of the hood.

The parts are baked after being sprayed and the whole setup of spray booths and bake ovens is in a single room built specially for these operations. The five spray booths are placed along two walls and the five ovens along the others. All paint laden air from the sprays is drawn through excelsior lined partitions in the hoods by motor fan and exhausted outside the building, the excelsior absorbing the paint. Fresh air is sucked in from the outside by another fan and distributed throughout the room by a duct with eight openings.

Four periodic ovens and one continuous-type oven are provided, all of sheet metal construction and gas heated. The continuous oven which is used for parts that can be dipped instead of sprayed is about 15 feet long, 10 feet high and 4 feet wide and is equipped with two parallel chains with rods suspended between them at short intervals. This conveyor rises from the bottom to the top on the outside of the oven before it enters, this portion being exposed for convenience in loading and unloading. Inside the oven the conveyor descends and rises seven times on a series of rollers, returning to the loading end in a separate compartment at the bottom. It is operated

by a ½-horsepower motor through a speed reduction gear train.

Heat is supplied by two atmospheric gas pipe burners located close to the bottom and extending almost across the oven. A temperature of 400 degrees Fahr. is automatically maintained with a temperature controller wired to a motor-operated, two-position valve in the gas supply line. There is also a recording pyrometer of the disk type. The baking interval is two hours and the oven has a capacity of 6000 pieces in 8 hours.

Safety devices of all kinds are used including two fire fighting bottles equipped with fusible links which are mounted just in front of and above the oven. If the oven or room temperature rises above the limit, the links let go and the chemical is sprayed over the booths and into the oven. At the same time all the fan motors and the circulation of air are stopped. Furthermore, if the motors of the fans exhausting the products of combustion from the oven should fail the gas supply is automatically turned off by a solenoid valve. Pilot lights are supplied to keep the burners going when the gas supply is on and this gas supply cannot be turned on until the pilots have been relighted.

Assembled on Punch Press

The final assembly of the reel is accomplished on a punch press with two dies. The operator secures a hub and square hole flange and positions it on the die. He places the jig around the hub, puts a round hole flange on the jig, then trips the press for assembly, moves the reel with the jig left onto die No. 2 and rivets. He disposes of the reel by placing it on a tray on a high lift truck at the right of the press. Inspection for running out of true consists in putting the reel on a spindle with a balance wheel, and twirling it.

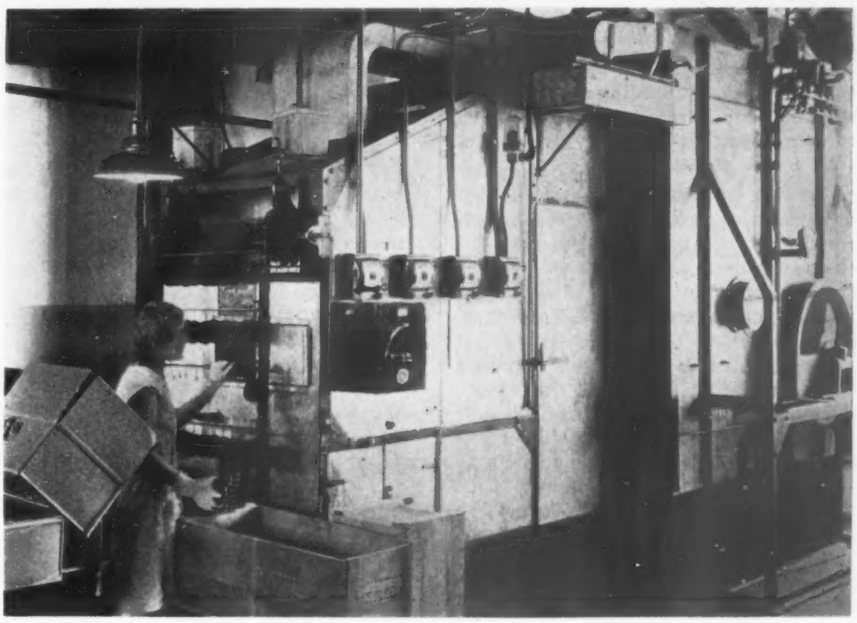
The assembled reels are sprayed again and baked after which they are inspected and gaged, the bottoms and covers put on, and a film put in and threaded through a slot for final inspection.

Another product, reel ends for film reels in the ordinary roll film camera, are formed from metal strips in 8 operations, 8 punch presses set in a row being used. They are formed several to a strip, with blanking as the last operation. The first four operations are forming to raise the hub and then follow in order perforating, bell mouthing, stamping and blanking. These presses make 198 revolutions per minute and are operated at 90 per cent of capacity.

The reel ends or flanges are then blued and rust-proofed in a battery of rotary, gas-fired furnaces, each about 6 feet long and 4 feet in diameter. These furnaces are of the tilting type and consist of an outer shell of refractory lined steel enclosing a metal retort which is rotated by motor through a speed reduction gear train. A vent in the top of the shell permits the products of combustion to escape into a common duct serving the entire battery from whence they are exhausted to the outside of the building.

Gas-Air Mixture Used

A series of burners in the bottom of each is supplied with a gas-air mixture of the proper ratio for complete combustion, air being supplied at 1½ pounds and gas at 4-inch pressure. An overhead monorail serves the entire line and is used for handling the material. Each furnace will process 750,000 parts daily, the heating period being 3 hours and the temperature 800 degrees Fahr. The flanges are then assembled to the wooden spindles.



Continuous gas-fired furnace for dipping and baking japan on camera parts

Steel Founders to Meet in New York Oct. 22-23

The Steel Founders' Society of America will hold its regular monthly meeting at Hotel Roosevelt, New York, Oct. 22-23. Some of the speakers at the meeting will be Arthur Marks, metallurgist and engineer, Boston; Clark McKercher, attorney-at-law, New York; Harold S. Falk, Falk Corp., Milwaukee, and Frank D. Glosser, Commercial Steel Casting Co., Marion, O.

Meetings of the society's merchandising committee, technical research committee, board of directors and group meetings of producers of large and small steel castings will be held. The newly organized heat and corrosion-resistant alloy founders' division, of which T. R. Heyward Jr., of the Duraloy Co., Pittsburgh is chairman, will meet Oct. 24 at the Graybar building, New York. Uniform cost accounting for alloy foundries will be discussed by H. S. Bartholomew, cost engineer.

Lighting Code Lists Need for Better Illumination

Development of better lighting facilities and greater knowledge of the science of illumination has brought about a revision of the "Code for Lighting Factories, Mills and Other Work Places" sponsored by the Illuminating Engineering society and approved recently by the American Standards society as American standard. The code lists advantages of good illumination as reduction of accidents, greater accuracy of workmanship, increased production, less eyestrain, greater contentment of workers, greater cleanliness, more order and neatness in the plant and supervision of the employes made easier.

Savings effected in economy of production by good illumination are estimated to be a significant item to the factory owner. It has been stated by the Travelers Insurance Co. that the services of 35,000 men throughout each year is lost because of lost-time nonfatal accidents with defective vision and deficient or unsatisfactory lighting installations as contributing factors in 18 per cent of these accidents.

Early production of gold plating or rolled gold is attributed to John Turner of Birmingham, England, who in 1817 took out a patent for its manufacture.

Physical Tests Reveal Useful Properties of Steel

IMPORTANCE attached to physical tests as means of determining the behavior of certain steels in various applications was demonstrated forcibly by the number of papers on this and closely allied subjects, presented at the National Metal congress in Chicago, Sept. 22-26, before technical sessions of the American Society for Steel Treating. Eight investigations, dealing with internal stresses in steel, fatigue testing, lack of uniformity in physical properties of bolts, and similar subjects, presented in paper form, evoked considerable discussion from the hundreds attending the various sessions, and threw welcome light on certain aspects of the performance of steel under stress.

Testing of over 3000 bolts for physical properties and the classification of these properties into 11 charts formed the basis of the discussion in a paper by H. B. Pulsifer, metallurgist Ferry Cap & Set Screw Co., Cleveland. The bolts tested were made of various types of steels and each chart indicated the distribution curves for the yield point, tensile strength, hardness and elongation of one material, the graphs in sum representing a provisional estimate of the properties and precision that present manufacturing methods and current steels make possible. The strengthening effect of threads, measured by a series of special tests comparing the physical properties of the normal bolts with test bolts machined to the root diameter of the threads, increased the yield point more than the tensile strength and the amount ranged from 6 to 26 per cent.

Rolling Threads Aids Strength

Discussion dealing with rolled and cut bolt threads suggested that rolling the threads increases the tensile strength. Prof. H. F. Moore, University of Illinois, Urbana, Ill., showed data indicating an increase of 13 per cent in strength of the rolled thread. A difficulty in the manufacture of bolts is in obtaining uniformity in physical properties. This was indicated by Mr. Pulsifer's observations and as a means in bringing about this uniformity, C. L. Harvey, metallurgist, Lamson-Sessions Co., Cleveland, pointed out three possible avenues of approach—better heat treating, closer control of chemical analyses and the use of alloying elements.

The development of cold heading in the bolt industry has presented numerous die problems and it has been found that the maximum production of cold heading dies is dependent upon five main factors, mainly, die steel, die design, die heat treatment, bolt material and machine operation. This information was contained in a paper by A. S. Jameson, metallurgist, International Harvester Co., Chicago, dealing primarily with die steel and heat treatment but discussing each of the other factors mentioned. Special stress was laid upon the importance of the depth of the hardened case of the die produced by heat treatment on die life.

Uniformity Important

The large number of variables present was emphasized in a discussion by Mr. Pulsifer, who also pointed out that uniformity in the steel used was a factor of highest importance in the production of efficient cold heading dies. Further discussion of Mr. Jameson's paper brought forth comments on normal and abnormal steels and the relative merits of alloy steels and carbon steels for these dies.

Internal stresses in hollow cylinders of carbon tool steel, quenched by two widely, different methods, were considered by O. V. Greene, metallurgist, Carpenter Steel Co., Reading, Pa., Stresses at the holes of hollow cylinders quenched by submerged flushing are either tangential tension, or a combination of tangential tension and compression. Stresses at the holes of cylinders quenched by flushing at the holes were uniformly tangential compression. Thus the latter treatment in using quenching stresses to advantage adapts such cylinders better to withstand internal pressures. Axial stresses at holes of all cylinders when present were compressional but of little consequence. The value of this flushing method lies in its application to the hardening of cold header dies to avoid danger of the dies cracking and to insure maximum strength of the hardened case.

Difficulties in the forms of low hardness and cracks often are encountered in the heat treatment and subsequent use of small dies made from plain carbon tool steel, according to a paper read by R. H. Harrington, research laboratories, General Electric Co., Schenectady, N. Y. and certain prequench treatments exert beneficial effect on the properties of the subsequently hardened tool steel.

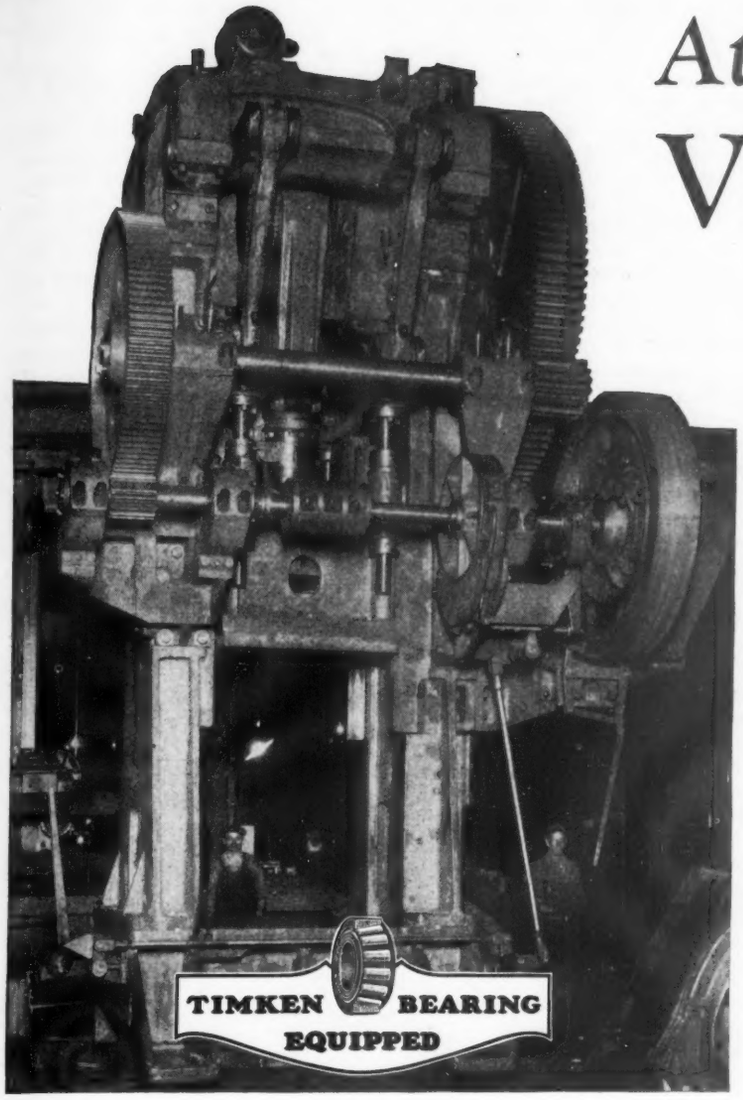
The recommended procedure for maximum hardness in the steel is to air-normalize from 1650 degrees Fahr., water-quench from 1470 degrees Fahr. and temper at 390 degrees Fahr. Oil-normalizing from 1650 degrees Fahr., water-quenching from 1380 degrees Fahr. and tempering at 390 degrees Fahr. yields an equally high hardness. For maximum body value Mr. Harrington recommended that the steel be annealed from 1470 degrees Fahr., water-quenched from 1380 degrees Fahr., and tempered at 390 degrees Fahr. For a combination of high hardness and good body, oil-normalizing from 1560 degrees Fahr., followed by water-quenching from 1470 degrees Fahr. and tempering at 390 degrees Fahr. was recommended as best practice.

All grinding processes introduce stresses in the surfaces ground and these stresses super-imposed upon the quenching stresses may be sufficient to crack the steel, according to research performed by Gerald R. Brophy, research laboratories, General Electric Co., Schenectady, N. Y. Pickling causes the stressed areas to crack and acids of different concentrations pick out the high and low stresses. The time in the bath is also a measure of the stress, low stresses requiring a stronger acid or a longer time in a given acid than do high stresses.

Along this same line, incipient cracks revealed in microscopic examination were suggested as being possible by H. H. Ashdown, metallurgist. Irvine, Pa., but this was denied by Mr. Brophy. Mr. Ashdown, told of an instance where pickling a 1/16-inch steel plate caused the appearance of large blisters, due, he stated, to discontinuities in the steel, atomic hydrogen being changed to molecular hydrogen upon reaching these cracks and forming the large blisters in the plate.

Testing Apparatus Discussed

Adaptability of three types of apparatus—the ball mill, the sand blast and the brinell abrasion machine—to the testing of the resistance of steels to abrasion was discussed in a paper by Samuel J. Rosenberg, assistant metallurgist, bureau of standards, Washington. In all of Mr. Rosenberg's extensive tests the wear was caused by the abrasion of sand on metal and not by metal on sand. The ball mill and sand blast tests were not entirely satisfactory; however, some interesting results were obtained from the brinell tests in which the plane surface of a specimen was pressed under a definite load against the edge of a slowly rotating open-hearth iron disk while a constant stream of standardized fine-grained sand was fed between the surfaces of the disk and the specimen. Results of the tests showed that the resistance to wear of a series of steels varying in carbon content from



At the Vital Points in Bliss Presses

TIMKEN
Tapered
ROLLER BEARINGS

Power must go into a machine before work can come out of it. The point of power application is therefore a vital point in the performance and dependability of any type of power-driven equipment.

That is why The E. W. Bliss Company, Brooklyn, New York, mount the drive shaft and fly-wheel of their stamping and drawing presses on Timken Bearings.

From long experience in designing and building such presses they know that if the power application is to be smooth, certain, dependable and economical, the power drive must be fully protected against speed, shock, fly-wheel torque, radial, thrust and combined loads.

Timken Bearings were naturally selected for this extremely heavy duty because they alone have the capacity necessary to meet all of the stipulated requirements—through the exclusive combination of Timken tapered construction, Timken positively aligned rolls and Timken-made steel.

And as a result, users of these presses benefit by uninterrupted service, reduced power demands, economical lubrication and low maintenance costs.

THE TIMKEN ROLLER BEARING COMPANY
C A N T O N, O H I O

0.08 to 1.29 per cent was dependent upon the hardness.

By means of photoelastic tests in an elastic material and by a comparison of the shearing stress trajectories derived from such tests with the slip lines produced under similar loading conditions in mild steel under high concentrated pressure, a study of the distribution of stresses in a number of cases of concentrated loads was made by Dr. A. Nadai, mechanics division, research laboratories, Westinghouse Electric & Mfg. Co., East Pittsburugh, Pa., and his results compiled in a paper which he presented. It was thought that by such tests some information on the processes taking place in the severely compressed parts of a rolled metal sheet during the rolling operation could be obtained.

Interesting Photographs Shown

A number of interesting photographs showing various types of slip lines resulting from several forms of pressure were shown by Dr. Nadai. The excellence of these photographs prompted an inquiry from Dr. O. W. Ellis, Ontario Research Foundation, Toronto, Ont., as to the method employed in obtaining the pictures. Dr. Nadai described the camera and setup used, an arrangement of two lenses, an arc light, a prism and the ordinary type of metallographic camera, a method developed a number of years ago by a German physicist.

Fatigue tests on steel specimens ranging in carbon content in the neighborhood of 0.44 per cent, performed on a small cantilever-type fatigue testing machine, weighing only 10 pounds, showed that no appreciable size effect occured from 0.050-inch to 2-inch diameter, according to research work carried out by R. E. Peterson, mechanics, division, research laboratories, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. When the same testing machine was used to test cast iron results were erratic and considerably lower than for specimens of ordinary size. For large specimens of steel stressed somewhat above the endurance limit heating sufficient to cause coloring occured. With such a condition fracture took place outside the colored region, indicating for medium carbon steels an increase of endurance limit with increased temperature up to at least 600 degrees Fahr.

In this connection a machine for fatigue testing sheet specimens, developed at the laboratories of the University of Illinois, Urbana, Ill., was described by Prof. Moore, of these laboratories. In this machine the specimen, a thin sheet, was clamped and vibrated through a crank, the vibration in turning deflecting a mirror which in turn moved a beam of light over a screen.

Enumerate Six Principles of Successful Selling

SIX prime factors for successful selling of any product—ideas, equipment or service—gleaned from listening over a period of 7½ years to over 15,000 actual sales situations, were enumerated by Prof. R. C. Borden and Alvin C. Busse, New York university, New York, at one of the most successful sessions, from the point of view of attendance, held by the American Society for Steel Treating during National Metal week in Chicago, Sept. 24. The two speakers illustrated their points forcefully and humanly by means of typical sales encounters, repeated with all the dramatic innuendoes possessed by the original dialogue. The powerful dramatic abilities of the two speakers, combined with their keen sense of humor, kept the audience in the "palm of their hand," so to speak, throughout the session.

According to Prof. Borden and Mr. Busse, the "heart and soul" of the sales situation is overcoming an objection of the purchasing agent. Pursuing this line of reasoning, the first point the salesman should watch is not to talk too much himself. He should make the prospect talk and himself remain the "world's best listener," yet a good talker when the occasion arises. The prospect, once convinced that the salesman is on the level and willing to hear what he has to say, will be slightly off guard and will bring out secret objections to buying which in his mind may be "hobgobline," or apparently insurmountable obstacles.

Secondly, the salesman should never to the slightest degree interrupt his prospect, consciously or unconsciously. A too eager salesman may often break into the statements of his prospect and although his interruption may be covered up, nevertheless, it will prove an irritant to the prospect.

The salesman should never slip unconsciously into an argumentative manner. He should constantly retain the professional attitude. Eagerness and enthusiasm, two virtues which all salesmen cultivate, are often confused with the argumentative style of address. Any trace of harshness, "sniffing" or "snorting" in the salesman's attitude and he is on the road to defeat.

Objections which a prospect holds to buying a product must be discovered, and the fourth point in the creed of the good salesman, ala Borden and Busse, is for the salesmen to inquire about the prospect's objections first and then answer them completely and effectively. As a fifth point, the prospect's objections should be repeated in the salesmen's own words to the prospect or he will never believe that the salesman understands his objections. If the objections are not restated by the salesman to the satisfaction of his prospect, the buyer will form his objections into other words in his own mind and another stumbling block will present itself.

Key Issue Is Required

As a final word of warning, the salesman should concentrate on one selling point, one fact or a key issue, which will clinch the sale. He must stick to this "theme song" and drive home the sale, avoiding any digression from the issue which might take his prospect's mind off the matter of buying.

In presenting these six highly important essentials to good selling the speakers introduced several short dialogues which illustrated various points which they had made, cleverly taking advantage of the humor of the situations. The dialogues were composites of a large number of actual conversations, and although the violations of "six points" were exaggerated greatly, nevertheless the adverse effects of the violations were plainly evident.

Bureau of Mines Tests Manganiferous Ores

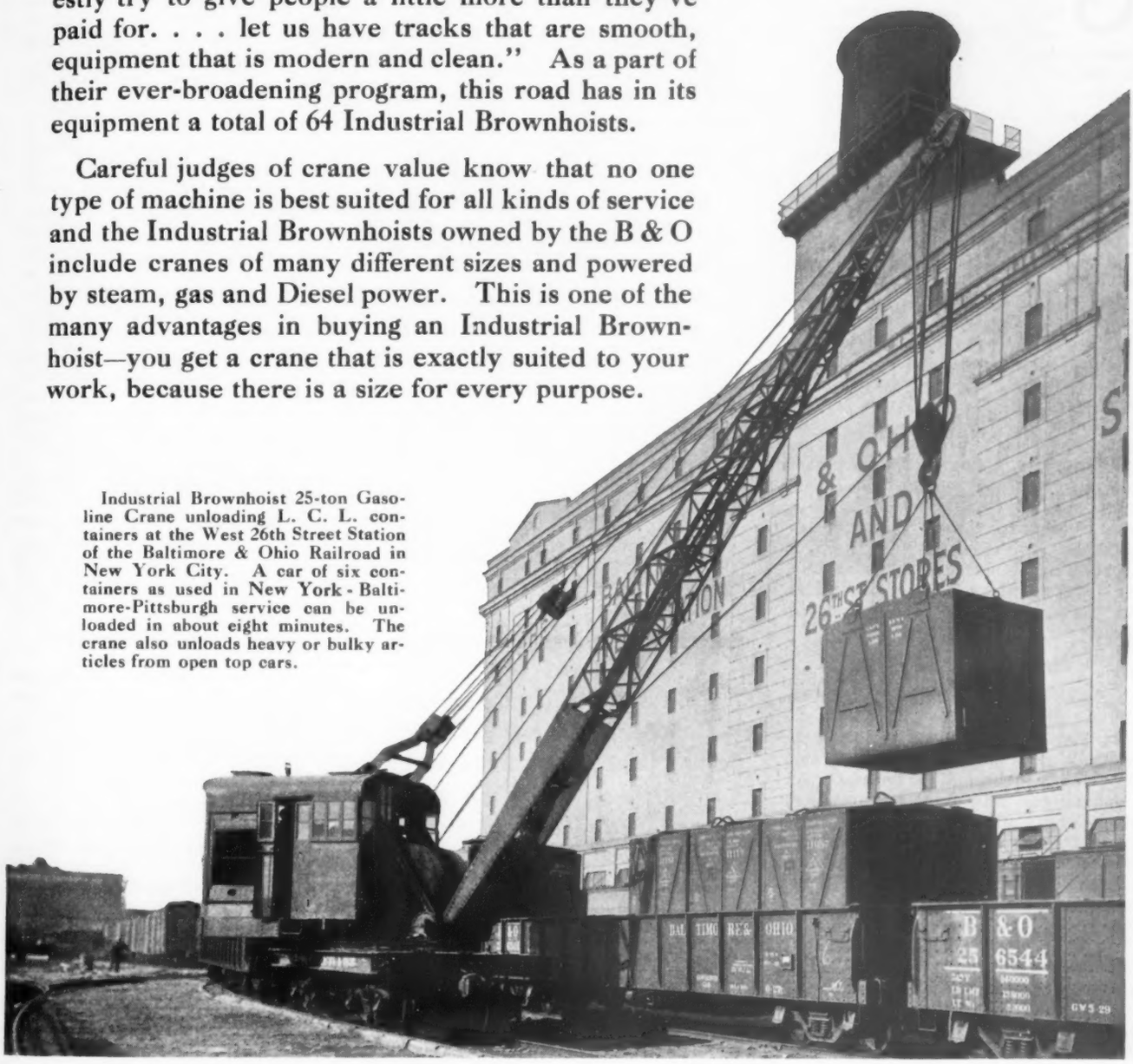
Limited domestic deposits of ferrograde ore requiring only simple methods of beneficiation and the importance of manganese ore in making steel have instigated an extensive investigation by the North Central Experiment Station of the bureau of mines, in co-operation with the University of Minnesota, Minneapolis, for a method whereby it will be possible to produce ferromanganese from large domestic deposits of manganiferous iron ore.

Recent tests conducted both in a small arc electric furnace and a small open-hearth furnace have shown that it is feasible to produce slags containing from 68 to 72 per cent manganous oxide, 6 to 10 per cent silica, under 0.2 per cent phosphorus, and 6 to 10 per cent ferrous oxide. Such slags are a decided improvement over those produced in previous tests. Further work with the electric furnace shows that it has several advantages over the open hearth for producing artificial ferro-grade ore from high-phosphorus spiegel.

The B & O Uses 64

Railroading today has become a highly developed personal service instead of just a matter of carrying passengers and hauling freight. Witness the Baltimore & Ohio, for example, who say, "We can honestly try to give people a little more than they've paid for. . . . let us have tracks that are smooth, equipment that is modern and clean." As a part of their ever-broadening program, this road has in its equipment a total of 64 Industrial Brownhoists.

Careful judges of crane value know that no one type of machine is best suited for all kinds of service and the Industrial Brownhoists owned by the B & O include cranes of many different sizes and powered by steam, gas and Diesel power. This is one of the many advantages in buying an Industrial Brownhoist—you get a crane that is exactly suited to your work, because there is a size for every purpose.



Industrial Brownhoist 25-ton Gasoline Crane unloading L. C. L. containers at the West 26th Street Station of the Baltimore & Ohio Railroad in New York City. A car of six containers as used in New York - Baltimore-Pittsburgh service can be unloaded in about eight minutes. The crane also unloads heavy or bulky articles from open top cars.

Industrial Brownhoist Corporation, General Offices, Cleveland, Ohio

District Offices: New York, Philadelphia, Pittsburgh, Detroit, Chicago, New Orleans, San Francisco, Cleveland.

Plants: Brownhoist Division, Cleveland; Industrial Division, Bay City, Michigan; Elyria Foundry Division, Elyria, Ohio.

INDUSTRIAL BROWNHOIST

Instruments Aid in Operating Gas Producers Economically

BY JAY S. McCLIMON

Steam and Fuel Engineer, National Tube Co.

GAS producers are employed widely in the steelmaking industry for converting coal into available power. The first authentic report of a gas producer was in 1861-62 when C. W. and F. Siemens used a unit in their experiments on open-hearth furnaces. No provision was made for forcing air into the producer which was similar to a salamander with the smoke used from off the top as shown in Fig. 2. Since 1861 there have been many modifications of gas producers.

The importance of good gas to the economical operation of a furnace was early recognized, and for this reason considerable attention has been given to gas producers by metallurgists, engineers and manufacturers, all working toward the goal of obtaining higher efficiency and economy in the utilization of fuel.

Producer gas is primarily a mixture of carbon of the fuel combined with oxygen of the air. The principle is to burn partially the fuel in the producer and to complete the combustion in the furnace. The object of this split combustion is to convert the solid fuel into a form of available power which can be handled more readily and economically in the furnace.

Built with Four Zones

A gas producer comprises a brick-lined shell, a jet blower or fan, a blast hood and four different zones; namely, ash combustion, green coal and mixing zones. Air is necessary for making gas, and since the producer is naturally air tight, the air is forced into the producer by a steam jet blower or fan. Each method has its desirable features. The fan will deliver a constant volume not readily affected by the back pressure, and the proportion of steam and air can be maintained uniformly over a wide range of capacities. A jet blower is an injector, the principle of which is the delivering from an orifice or nozzle a stream of steam or air at high pressure. Due to its velocity and expansion, the amount of air put in motion may be from 4 to 10 times that actually delivered from the nozzle.

In a gas producer these jets are multiplied, each one larger than the preceding one. A blower may contain from two to eight nozzles and be capable of delivering from 8000 to 500,000 cubic feet of air an hour. Since it requires about 50 cubic feet of air to gasify 1 pound of coal, it is obvious that capacities can be obtained from 160 to 10,000 pounds of coal an hour.

Requires Ample Size Blower

For gas-producer use the blower should be large enough to deliver the necessary air for the required capacity at a moderate steam pressure, and the proportion of steam to the air delivered should remain constant over the working range of the producer. Fig. 3 shows the relation of steam pressure to producer capacity. It will be noticed that above a certain point the steam pressure has little effect upon the producer capacity. By altering the size of the steam nozzle, different capacities can be obtained with the same steam pressure. For instance, changing the steam nozzle from 7/16 to 9/16 inch, the capacity at 50 pounds of steam is increased by about 28 per cent, but the amount of steam used has been increased by nearly 65 per cent.

Fig. 4 shows results of a blower test on another type of producer. The same general characteristics as applied to Fig. 3 are noticed. The blowers on which this test was made were equipped with ½-inch steam nozzles, after they were changed to 7/16-inch better results were obtained. Blower No. 1 is a larger unit with more capacity than blower No. 2. The same steam pressure will gasify about 40 per cent more fuel. The test shows that little dependence can be placed on steam pressure as a guide to producer operation.

The distributing hood inside the producer may be of various shapes, style or size, depending upon the manufacturer's idea or desire. Its main purpose is to distribute the blast so it will reach the outside of the producer and yet allow a sufficient amount to come up the center; otherwise, the producer will not work uniformly.

With American soft coals it is necessary that some form of agitation be used to break up the pasty condition of the fuel bed. This is accomplished in several ways. One manufacturer uses a single poker inclined toward the fuel bed, the poker swinging laterally across the producer as the fuel bed revolves. Another has a single vertical stem at the center of the producer, and at the bottom a horizontal sweep with teeth. This revolves on top of the fuel bed which remains stationary. A third manufacturer used two curved arms which revolve on a vertical axis; the fuel bed also revolves. The resulting action is like an egg beater. Still another manufacturer uses a flat bar or leveler, which being heavily weighted drags over the fuel bed as it is revolved. Agitation is obtained by crushing together the particles in the fuel bed.

Afford Uniform Operation

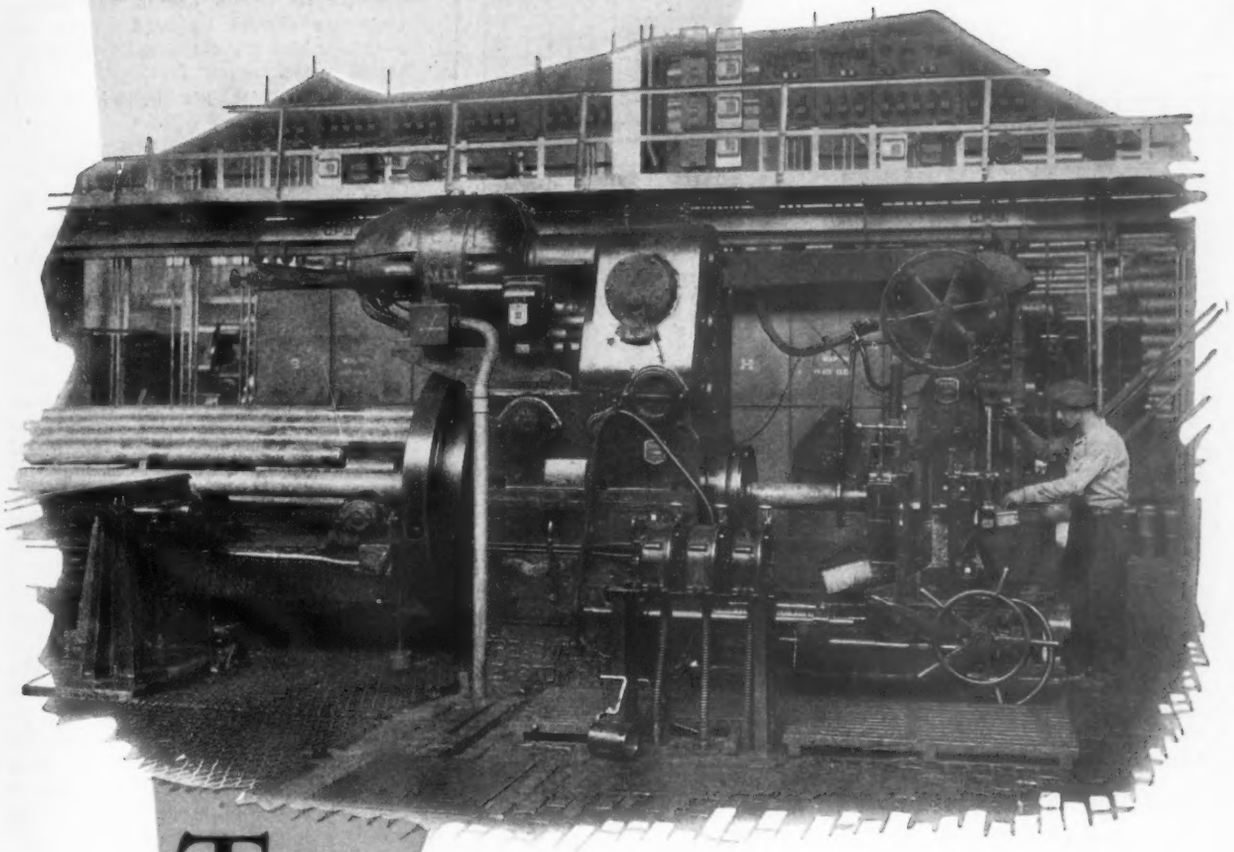
While the auxiliaries about the gas producer, such as mechanical coal feeders, ash plows, etc., are mostly labor-saving devices, they have considerable effect because of the uniformity of their operation.

Visualize a salamander as an example of a gas producer. It has an open top and open sides which permit the technic of its workings to be observed. At the bottom in the ash zone next, is the fire zone; and on top, the green coal zone. If the coal was laid carefully on the top without breaking down the fire, the fuel would burn out of the fire zone until it became porous and the fire would go out even though there might still be considerably unburned fuel on the top. Slack cannot be burned in a salamander unless it is poked to keep the top open. The same things apply to a gas producer.

A gas producer is a chemical vessel. The thermo chemistry of its workings therefore, is important. Carbon and oxygen will combine only in the presence of heat the speed with which they combine depends upon the temperature. The first reaction of carbon and oxygen is $C + O_2 = CO_2$ com-

ECONOMICAL operation of open hearths and steel mill heating furnaces is contingent in a large measure upon the grade of gas used. Low-quality gas prolongs the melting time of open-hearth heats and reduces the output of rolled products. The efficiency of the fuel utilized for these purposes is dependent upon many factors among which is gas-producer operation. In discussing gasification methods the author, Jay S. McClimon, steam and fuel engineer, National Tube Co., Gary, Ind., cites many practical details of producer practice.

TREADWELL



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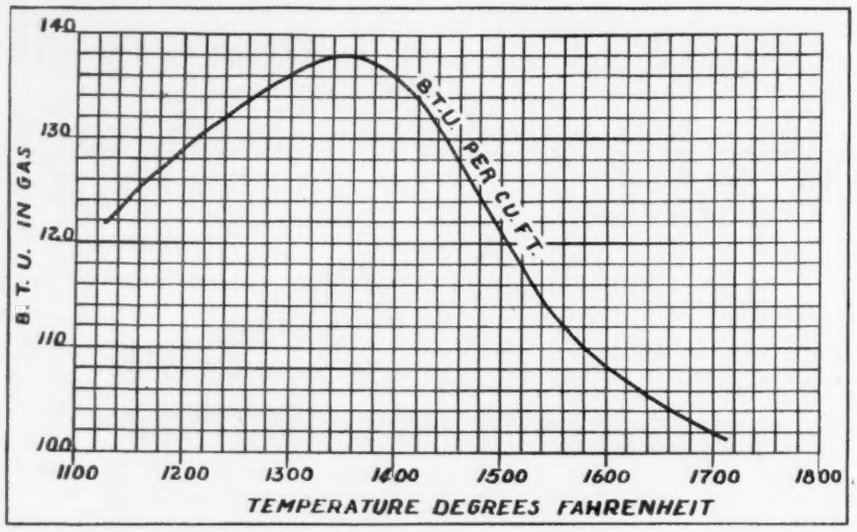

Fig. 1—Chart showing the quality of gas in relation to temperature

bining on the basis of 1 pound of carbon plus 2.66 pounds of O_2 equals 3.66 pounds of CO_2. This reaction takes place in the producer and it liberates 14,500 B.t.u. for every pound of carbon thus combined. As the gas passes upward through the fuel bed the incandescent carbon pulls one part of oxygen from this combination in the following manner: 3.66 pounds of CO_2 + 1 pound of C = 4.66 pounds of CO. In this reaction approximately 10,200 B.t.u.'s. are absorbed with each pound of carbon in the final gas. This heat is available when the gas is again converted to CO_2 in the furnace.

Excess Heat Must Be Controlled

Notice that about 4400 B.t.u.'s per pound of carbon remains behind in the producer. This heat, in addition to that liberated by the CO_2 going through undecomposed, must be taken care of in some manner, otherwise, the temperature would build up to the point exceeding the fusing point of the ash. This, of course, would result in a shut down. Excess heat must be controlled by injecting steam into the producer along with the air. In the Siemens producer it was possible for radiation to balance this excess heat because of the small capacity of the producer. It takes a temperature of approximately 2500 degrees Fahr, to break CO_2 into CO, even with this temperature the velocity of the gas through the fuel zone should not exceed 1 foot per second for best results. This may be exceeded slightly in some bases, but the point to remember is that this reaction is not instantaneous, no more than is the combining of the gas and oxygen in the furnace.

At temperatures over 1650 degrees Fahr., water in the presence of carbon will combine into CO and H_2 in the proportion of 1 pound of C to 1½ pounds of H_2O to form 2.33 pounds of CO and 0.166 pounds H_2. This reaction absorbs 4320 B.t.u.'s. for each pound of carbon thus combined. This balances the excess heat in the producer, and improves the quality of the gas. Control of the amount of moisture entering the producer usually is accomplished by shutting off the air with dampers or slides on the top of the blower which changes the proportion of air and steam. The disadvantage of this is that cutting off the air, also reduces the capacity of the producer.

Steam Affects Temperature

Care must be taken in the use of steam, because if excessive, so much heat is taken from the producer that the temperature will drop below 2500 degrees Fahr. and an excess of CO_2 will go through the producer undecomposed. If this excess steam is continued, the temperature will drop until the steam will go through the producer in the form CO_2 instead of CO, because at temperatures below 1650 degrees Fahr. steam in the presence of carbon combines into CO_2 and H_2 in the proportion of 1 pound of carbon to 3 pounds of H_2O to form 3.66 pounds CO_2 and 0.33 pound H_2. This has a tendency to further destroy the quality of the gas instead of improving it. The use of the steam, therefore should be kept as low as possible, best results usually being obtaned when using from 0.3 to 0.5 pound of steam per pound of coal gasified.

Excess of Heat Is Convenient

From an operating standpoint it is easier to use an excess of steam in the blast than the correct amount, because steam will keep the fires soft and easy to clean. It is an old trick for the gasmaker to close the blower lids or shove rags into the blower case to make the fires soft and easy to clean. At the same time, another gasmaker would be in trouble continuously, because his producer would have to carry the load that lack of sufficient air had taken off the other producers. This practice is sometimes hard to stop, because one cannot be governed by general appearances. Moreover it is difficult to judge the quality of producer gas by its appearance.

In addition to blowers other elements enter into producer operation such as uniformity of feeding, removal of ashes, agitation above and below the fuel bed, etc. All have their effect, and a considerable bearing on the results obtained, but without proper blower setting, good producer operation is impossible.

As the blast leaves the blast pipe it passes upward through the ashes which act as a distributor. The ashes

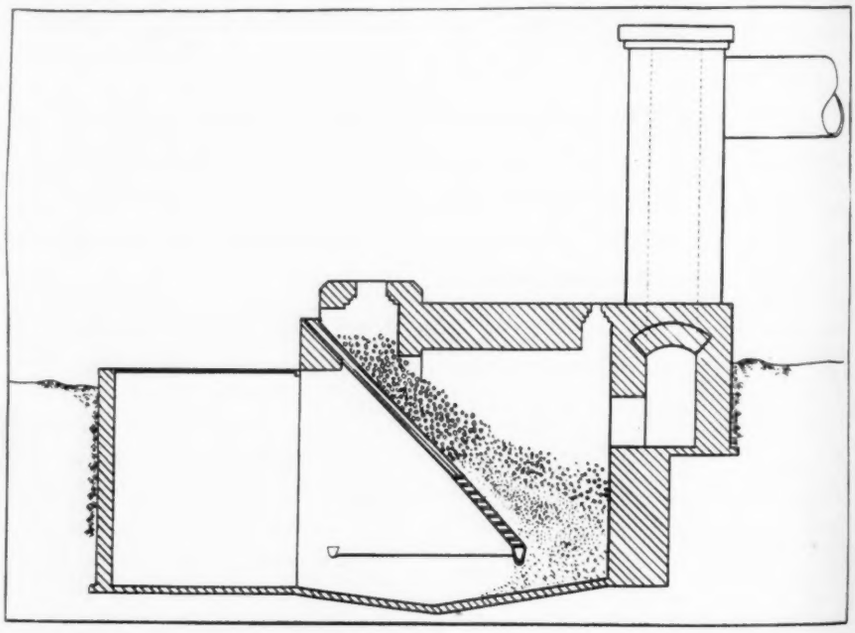

Fig. 2—Cross section of gas producer operated by Siemens in 1861-62

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also preheat the blast as they work down from the fire zone. It can be seen that physical uniformity of the ashes over the entire producer is essential, and the necessity of keeping this ash bed neither too high nor too low is easily apparent. With a thin ash zone the blast comes from under the hood striking the fire direct with no distribution. An intense heat is developed at that point which is certain to result in clinkers and a hot producer. If the ash zone is too deep, the resistance set up by these ashes is excessive, and a weak point is certain to develop. This permits the

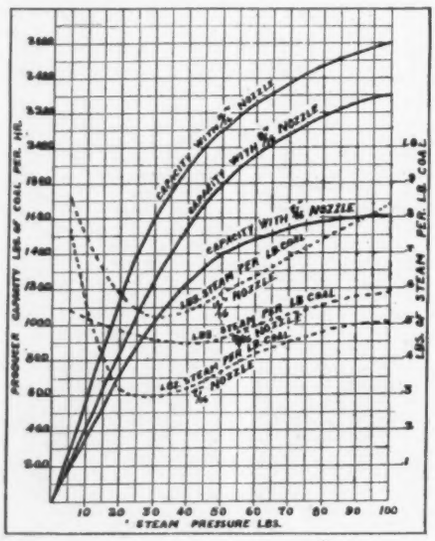
PRODUCER CAPACITY LBS. OF COAL PER HR.
LBS. OF STEAM PER LB. COAL
CAPACITY WITH ¾" NOZZLE
CAPACITY WITH ⅝" NOZZLE
CAPACITY WITH ½" NOZZLE
LBS. STEAM PER LB. COAL ½" NOZZLE
LBS. STEAM PER LB. COAL ⅝" NOZZLE
LBS. STEAM PER LB. COAL ¾" NOZZLE
10 20 30 40 50 60 70 80 90 100
STEAM PRESSURE LBS.

Fig. 3—Chart showing the relation of steam pressure to producer capacity

blast to rush to one point, causing the same condition as existed with a low-ash bed. Thus, the same effect may be caused by two distinctly opposite seasons, requiring different treatment.

From 96 to 98 per cent of all the gas passing out of the producer is formed in the combustion zone. The control of this is maintained by the steam and air ratio in the blast, and the condition of the ash zone over the blower hood. The fuel zone on top of the combustion zone accounts for 2 to 4 per cent of the gas by a process of distillation exactly as in coke ovens. This is the start of the gasification process. The coal is dumped on the top uniformly. The depth of this zone governs the temperature of the gas leaving the producer.

The kind of coal necessary for the operation of a gas producer varies with requirements. Almost any fuel containing sufficient carbon to support combustion can be gasified. However, the quantity and quality of the gas obtained, and the possible rate of gasification are subject to wide variations, depending upon the quality of the coal and its physical characteristics.

Some coals have a tendency to become soft and pasty under heat. Others will swell and crack into fine pieces, while still other coals will hold their shape and burn uniformly. This latter type of coal is ideal for producer use. It is obvious that the ideal fuel for a gas producer would be of uniform size, small enough to burn rapidly in the combustion zone, and yet large enough to provide plenty of voids between the lumps for the gas to pass readily through the coal zone.

With fine coal the producer is practically sealed at the top, and the gas as it breaks through from the pressure below never does so uniformly. This naturally causes intense local heats and clinkering. The only remedy when using fine coal is to carry a thin fuel bed and low fires, which makes a hot producer and a poor quality of gas. A coal that will swell or burst has the same effect as using fine coal. Too rapid agitation of the fuel bed or over-poking will do the same thing. In some cases in order to improve producer practice, it is necessary to reduce the speed of the producer; in other cases, it is necessary to speed them up, but the same treatment will not apply in all cases.

Uniform Distribution Essential

To control the fuel zone it is necessary to distribute the coal uniformly over the entire area of the producer at a speed consistent with the rate of gasification. If less than the consumption, the fires will get hot because of lack of sufficient depth in the fuel zone for the proper cooling effect on the gases. If coal is dumped too rapidly, the fires will first get cold, but when the resistance to the blast increases, it forms channels, and breaks out in spots; clinkers will form and the fires will get hot. Again, a condition will exist which might be caused by two exactly opposite reasons requiring different treatment. It is extremely illogical to assume that the remedy for an ailing producer can be determined by one look at a poke hole.

How then can a producer be operated to insure the maximum results? Glass and chemical manufacturers recognize the importance of producer control. Some of these companies have been using exact producer control for several years. The first step is to determine the value of the material handled. Some idea of the possibilities for savings can be made by comparing the boiler house to the gas producer. They both perform the same duty; namely, the conversion of coal into available power.

A boiler of 1000 horsepower operating at about 150 per cent rating, in a modern central station, will consume about 5500 pounds of coal an hour, which at $11 a ton, will cost approximately $260 a day. On this boiler will be found water and draft regulators, flow meters for steam and feed water, a flue gas temperature recorder, several draft gages, a CO_2 recorder and undoubtedly a preheater, a heat exchanger and an economizer. The total cost of these appliances may be from $6000 to $8000, and their total purpose is the saving of fuel.

A gas producer will burn from 1400 to 2500 pounds of coal an hour. Usually four producers can be considered as one unit. This unit will burn over 7000 pounds of coal an hour costing from $1.50 to $2.50 a ton more than the fuel burned under the boiler. The cost of this fuel will be over $20 an hour, or $480 a day, or 80 per cent more than the unit in the boiler house. Usually about the only assistance the gasmaker is given to handle

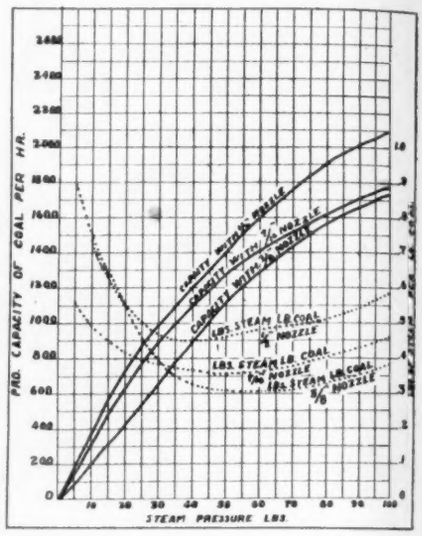
PRO. CAPACITY OF COAL PER HR.
CAPACITY WITH ¾" NOZZLE
CAPACITY WITH ⅝" NOZZLE
CAPACITY WITH ½" NOZZLE
LBS. STEAM LB. COAL ½" NOZZLE
LBS. STEAM LB. COAL ⅝" NOZZLE
LBS. STEAM LB. COAL ¾" NOZZLE
STEAM PRESSURE LBS.

Fig. 4—Chart showing producer capacity as related to the steam pressure

80 per cent more money than the boiler house, is a home-made regulator costing about $25, and a steam gage.

Saving of fuel in a gas producer can be accomplished exactly as it is done in the boiler house by equipping the units with instruments which will give a reliable and continuous record of operation. These records must be checked to insure that the instruments are accurate and the operation is kept within the specified limits. It has been proven that the temperature of the gas leaving the producer is a direct indication of its quality. Fig. 2 shows this relation. For this reason every gas producer should be equipped with a pyrometer.

Adopt New Motor Standards

New standards recently adopted by the National Electrical Manufacturers association through its standards committee include revised and original standards on engine-driven alternators, planer-type motors, elevator motors and motor generators, drip-proof fully protected motors, crane motors, oil circuit breakers, switching equipment, transformer impedance and attachment plugs.

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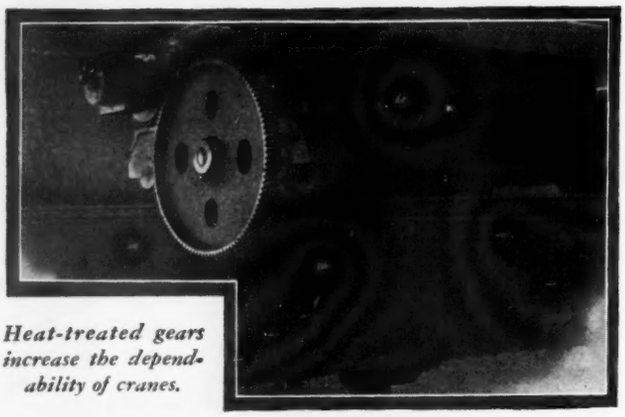
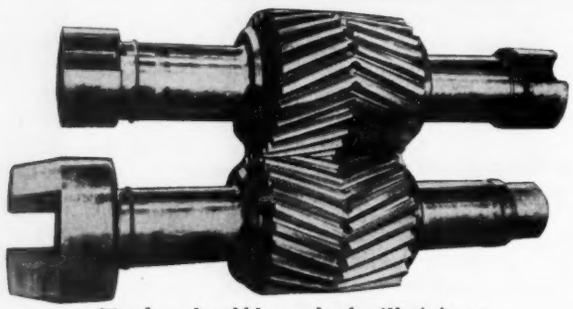
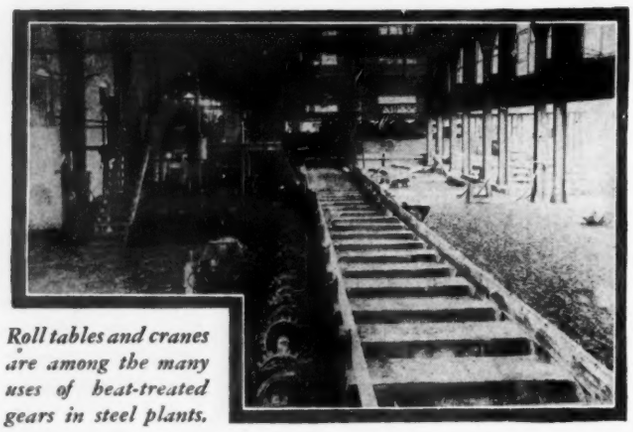


Heat-treated gears increase the dependability of cranes.



Teeth and wobbler ends of mill pinions wear longer when EP heat-treated.



Roll tables and cranes are among the many uses of heat-treated gears in steel plants.

LONGER life, greater dependability and lower maintenance are pertinent advantages of using heat-treated gearing that need not be sacrificed in any gear drive for any kind of service.

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The complete Westinghouse-Nuttall heat-treating facilities also include equipment for applying case hardening, oil treating, water, brine or chemical quenching and other conventional processes to gears of plain or alloy steels up to 102 inches in diameter.

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Accidents in Metal Industry Fewer but More Severe

ACCIDENTS in the metals industry continue to decline in number, but show an increase in severity. This fact was established in the report on accident statistics for 1929, presented before the metals section of the National Safety council during the annual safety congress in Pittsburgh, Sept. 29-Oct. 3. According to E. R. Rose, safety director, Republic Steel Corp., Youngstown, O., who submitted the report, the frequency rate of accidents in 1929 in the steel industry has been declining since 1927 and was 19 per cent less than during that year, but the severity rate was 32 per cent higher. This increase is due to a rise in fatal and permanent injuries during these years. The rates for temporary disability accidents, on the other hand, have decreased steadily.

Distribution of the severity rate for steel plants for 1929 shows that 58 per cent of the days lost were due to fatal accidents, 30 per cent to permanent disabilities and only 12 per cent to temporary causes. This circumstance, Mr. Rose pointed out raises the question whether too much attention is being centered on minor hazards and not enough on conditions producing fatal and permanent injuries.

Steel Plants Lead

Steel plants showed the best frequency rate, or the number of lost-time personal injuries per 1,000,000 hours exposure, of the metals group, the figure for 1929 being 18.13, compared with an average of 22.64 for all divisions, but an increase compared with the 17.50 rate for 1928. The 1928 average for all divisions was 23.90. The severity rate, or number of days lost from accidents per 1000 working hours, for all metal groups increased from 1.68 in 1928 to 2.15 in 1929, while the figure for steel plants rose from 2.07 in 1928 and 2.75 in 1929.

More complete figures on accidents are being obtained from the metals sections due to an increase in number of reporting companies. Reports for 1929 numbered 585, compared with 448 in 1928, with an increase of 39 per cent in number of man-hours of exposure. The gain in reporting of steel plant figures was more than 50 per cent with an increase of 75 per cent in hours of exposure.

The human element remains the important factor in effecting safety in steel erection, it was pointed out by W. A. Hazard, superintendent of erection, Bethlehem Steel Co., Bethlehem, Pa., in discussing "Safety in the Erection of Steel." Problems in this industry make is difficult to draw up set rules for observance and safety is largely a matter of judgment on the part of the foreman, superintendents and workers, he stated. At the same time, this judgment must be supported by the use of proper equipment in good condition. Overhauling, repair and inspection of equipment before starting work on a job is of paramount importance. Responsibility for condition of equipment rests upon the employer, and the workman who finds tools in shape and processes and methods of erection well planned for his safety will be more impressed than he would be by lectures.

Rest Period Required

Physical fatigue in steel erection is occupying more attention of employers, Mr. Hazard stated, adding that a New York regulation provides that workers must receive a rest period of one-half hour if obliged to climb more than 15 stories. Use of chain in hosting work largely has been dispensed with, but hoisting cables should be regularly inspected. Accidents frequently may be blamed upon persons other than the workers, according to Mr. Hazard, such as in cases where shapes have been loaded carelessly by the shop in being sent to a job, as well as in instances where unusually large lifts are problems for the engineering department to work out rather than to be left to men in the field for solution.

The machine age has reduced accidents by supplanting the type of labor most susceptible to injury, according to Dr. R. H. Lansburgh, First National bank, Detroit.

Considerable discussion was brought out regarding schools for foremen, following a paper on "The Foreman As a Safety Factor in Production," by F. J. O'Connor, welfare superintendent, E. I. du Pont de Nemours & Co., Pennsgrove, N. J. Many steel companies provide such schools for training foremen in production as well as safety methods, several representatives related. The foreman occupies an important position in the direction of accident prevention work, Mr. O'Connor stated.

The safety record of the foundry industry continues unsatisfactory despite the active programs in accident prevention work being carried out by many of the leading interests, it was brought out at the foundry session. Both the frequency and severity of accidents increased last year and were higher than in 1928 or 1927. It was pointed out by several speakers at the session that although the safety movement is solidly installed in the majority of the larger foundries that many small companies have made no concerted effort to reduce accidents and this has reacted to the detriment of the record for the industry in general.

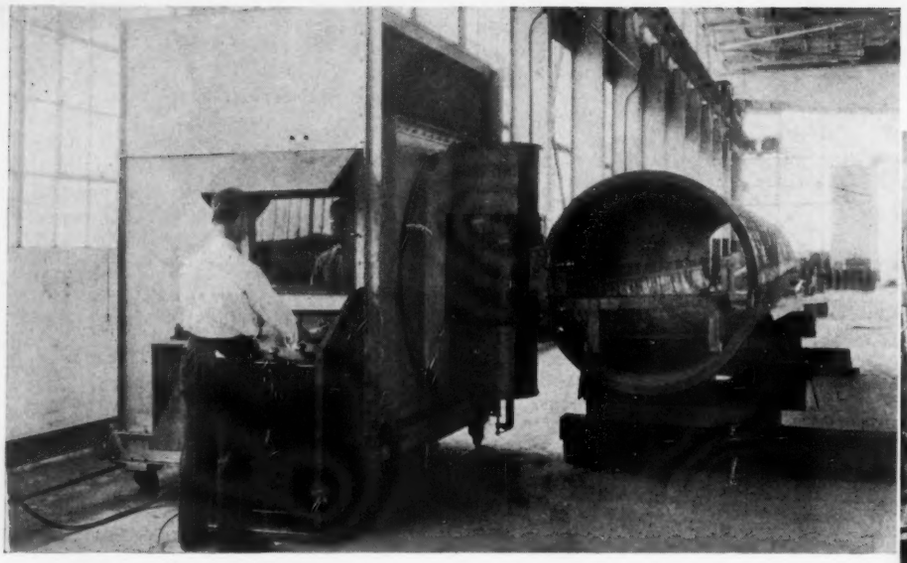
The frequency rates of accidents among steel, gray iron and malleable iron foundries last year were 51.14, 52.37 and 59.91, respectively, against 40.03, 52.42 and 61.66 in 1928. These compare with an average of 22.64 for the entire metals section for 1929, and 23.90 the preceding year. The severity rates of the three foundry groups were 2.47, 2.14 and 1.76. compared with 1.58, 1.34 and 1.76 the preceding year. The average for the metals section increased from 1.68 to 2.15 last year.

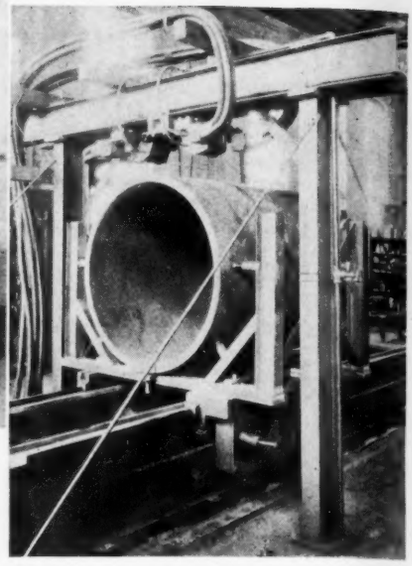
A program for furthering safety work which has passed through two stages, the guarding of machine and education in safety, was proposed by J. W. Beall, insurance commissioner, Ohio Steel Foundry Co., Lima, O., in a paper on "Foundry Engineering and Safety." His program seeks "the purposeful elimination of misguiding sentimentalism from accident prevention safety program work," the charging of accident costs along with overhead and production costs to the department where accidents are permitted to occur, and the use of discipline in enforcing safety measures.

Discuss Protection Devices

Considerable discussion developed on experiences of various foundries in use of protective devices for the hand, foot and head. In a paper on this subject, S. W. Doran, personnel superintendent, Pratt & Letchworth Co., Buffalo, pointed out that flask handling is responsible for many hand accidents and is one of the local points of attack in the elimination of such injuries. A thorough understanding of signals for the movement of cranes was stated as important in overcoming this hazard. Faulty hooking was charged by the speaker with chief responsibility for most falling objects.

Lax enforcement of the wearing of goggles and the use of welding goggles in doing chipping work were blamed for eye injuries. Improved guarding of grinding equipment has reduced the eye hazard considerably, it was stated, but this often is offset by the careless use of goggles. Opinion on whether goggles should be used in pouring metal differed, some foundry representatives reporting success in their employment and others stating that the glass becomes fogged so easily as to create a hazard. Difficulty in forcing employes to wear goggles has been overcome at some plants by layoffs for initial offences and discharge for repeated violations of the rule, it was stated.





Apparatus used for production x-ray examination of welded pressure vessels. This particular drum is made of 2½-inch plate. The presence of a crack in the weld of pressure vessels is indicated by the electromagnetic apparatus shown at right

Develops New Technique in Electric Arc Welding

BY J. D. KNOX

Associate Editor, STEEL

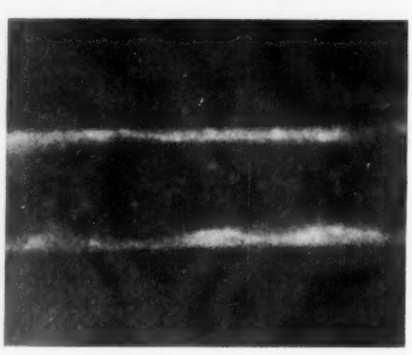
RESEARCH work of a fundamental character conducted for many months at the Barberton, O., plant of the Babcock & Wilcox Co., has resulted in a new technique of fusion welding. A new type of electrode has been developed by the research staff of the company and a special arc-welding machine evolved for the standard commercial types.

Stable Arc Is Produced

The composition of the weld metal includes less than 0.04 per cent sulphur, from 0.30 to 0.60 per cent manganese, less than 0.04 per cent phosphorus, from 0.08 to 0.15 per cent carbon and less than 0.02 per cent nitrogen. The electrode produces a quiet and stable arc and causes practically no spattering of metal during the welding operation. The welding rod is mounted vertically in a feeding device which is self-propelled forward or backward by an adjustable-speed motor along the horizontal seam of the tank being welded. No skill on the part of the operator is required to produce sound welds because once the feeding device is started, the electrode is fed to the weld accurately and at a uniform rate. Approximately 30 minutes is required to weld 18 to 20 feet of seam.

Steel drums subjected to the welding operation are left in a stressed condition and must be annealed. This treatment is performed at the Barberton shop of the company in a newly developed gas-fired furnace of the cylindrical type.

A flash welding machine at present is being operated experimentally by the company to join short lengths of pipe but later will be employed to weld flanges and headers for boiler equipment. Pipe of 14 inches outside diameter and 1-3/16 inches wall thickness recently was welded by this method at a power rating of 1300 kilovolt-amperes.



Radiograph of weld showing defect along wall of joint

Metallurgists of the company have subjected to various physical tests hundreds of specimens of steel welded with the newly developed electrodes. The weld metal investigated showed a minimum of 65,000 pounds and a maximum of 74,500 pounds per square inch ultimate tensile strength, compared with a minimum of 55,000 pounds and a maximum of 65,000 pounds per square inch for the plate; and a yield point ranging from 40,000 to 55,000 pounds per square inch.

Test Results Given

Test results of numerous specimens of all-weld metal ranged from 20½ to 38 per cent elongation in 2 inches and from 32 to 65 per cent reduction of area. In making bend tests the specimens were bent to an inside diameter equal to the thickness of the plate, the outside fibers withstanding an elongation ranging from 30 to 65 per cent. The ability of the weld to resist the spread of a crack, once started in the metal, is shown by Charpy impact values which range from 19 to 33 foot pounds for boiler plate of American Society of Mechanical Engineers specification compared with a range of 20 to 45 foot pounds for weld metal developed by the Babcock & Wilcox Co.

Two different types of tests were made to determine the fatigue value. In one set of tests, specimens were mounted in rotating beam machines and subjected to reverse stresses and the endurance limit of the welds determined. In the other tests, drums were subjected to repeated pressure

applications and the results studied.

The rotating beam tests showed an indicated limit of about 30,000 pounds per square inch for the weld metal as compared to 28,000 pounds per square inch boiler plate steel. One specimen was subjected to 13,697,400 cycles at a calculated stress of 23,100 pounds per square inch without failure. Another specimen withstood somewhat over 10,000,000 cycles at 30,000 pounds per square inch stress.

In the repeated pressure test water under pressure alternately was admitted to and exhausted from the test shell. This series of tests included 13 full-size drums and shells of various materials and construction including firebox, quality and manganese steel in riveted, forged and welded construction. The welded drums withstood a number of pressure applications greatly in excess of any imposed by normal service. One drum had over 2,000,000 pressure variations at 16,500 pounds per square inch stress across the welded seam without failure.

Welds Are Explored

X-ray photography is used at the Barberton plant to explore and verify welds in finished products. The machine used for this purpose and shown in an accompanying illustration is the first to be employed for production x-ray examination of welded drums. The unit is housed in a specially-designed steel cabinet mounted on casters and can be elevated or lowered to the height desired for making exposures. The machine permits the routine inspection of both longitudinal and circumferential seams. About one hour is required to x-ray a longitudinal seam 10 feet long in a 2½-inch drum.

Electromagnetic testing is made with equipment developed at the Barberton shops by the Sperry Development Co., New York. The electrodes shown in an elevated position in an accompanying illustration are made to contact with the surface of the steel drum on either side of the welded seam. Electric current passing through the weld establishes a magnetic field which varies in intensity according to the defects present in the weld. Such variations are picked up by a balanced coil mounted over the welded seam and are transmitted through suitable relays to a recording apparatus which draws a graph of the weld.

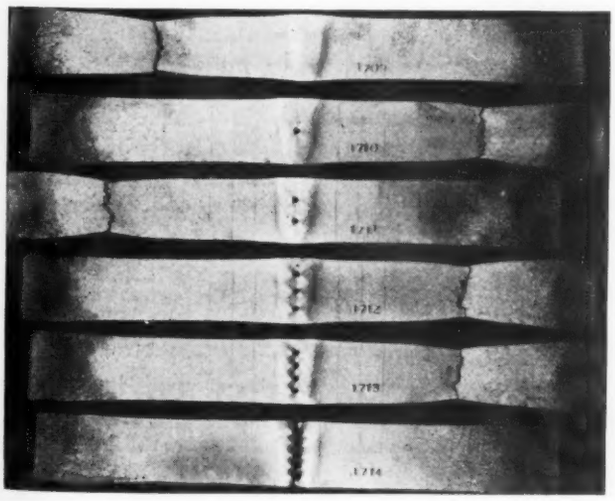
New Book Will List Latest Data on Coke Manufacture

Specifications for blast furnace coke and the methods of its manufacture are to be described compeltely in the first report of the Midland Coke Research committee, London, England, entitled "Coke for Blast Furnaces." The 260-page book is to be divided into two parts entitled "The Specification of Blast Furnace Coke" and

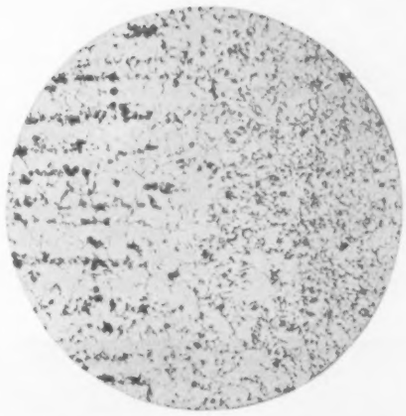
Welded plate specimen, 2 inches thick, bent through an arc of 180 degrees

"The Manufacture of Blast Furnace Coke of Specification." There is to be included tabular records of tests on cokes examined by the committee.

This book will record the results of the work of a committee composed mainly of representatives of the coke



Tension specimens transverse to welded joint. Five ⅛-inch holes, corresponding to a reduction of 35 per cent at cross section at weld, were required to produce failure. Ultimate tensile strength, 74,200 pounds per square inch



Photomicrograph of pressure vessel welded joint showing junction of base metal on left and weld metal on right

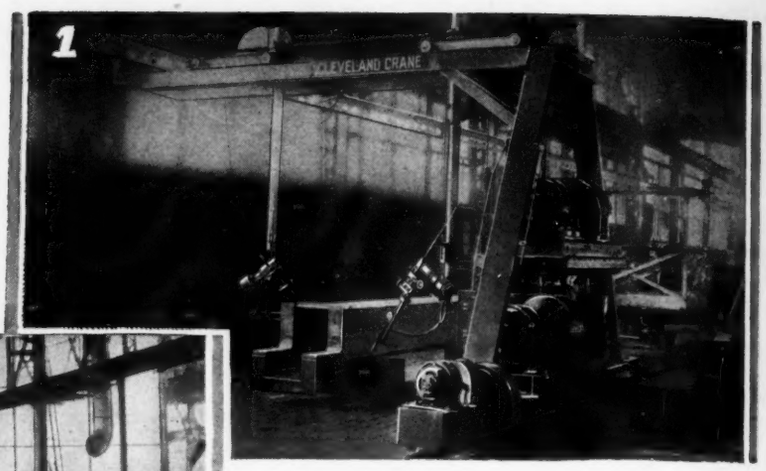
users and coke producers. It is based on large-scale and laboratory tests made at coke ovens and blast furnaces and on research work carried out in the department of fuel technology of Sheffield university. The authors have reported the results in such a manner as to show how the different properties required in a blast-furnace coke can be specified and how those properties are affected by selection and blending of the coal charge and by the conditions of coke making.

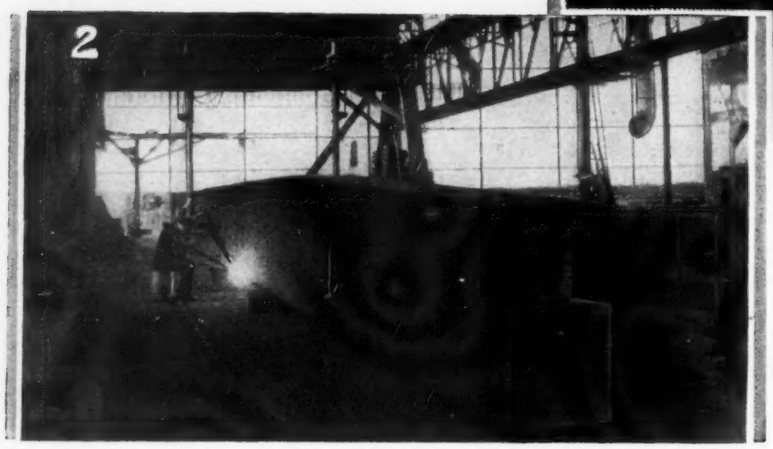
Revised Canadian Steel Standards Published

Structural steel standards of Canada entitled "Standard Specifications for Steel Structures for Building," have been published in a new edition by the Canadian Engineering Standards association, according to the American Standards association, New York. Among the changes noted in this second edition are those which increase permissable unit stresses; and particularly the permissible unit stress for axial tension, which is raised from 16,000 pounds per square inch to 18,000 pounds per square inch. Other revisions are those in the column formula and for standard allowances for snow load and for wind load.

Booklet Outlines Policies of Alloys of Iron Research

The purposes, organization, personnel, policies and participants in the study of the alloys of iron are presented in bulletin No. 4 of the Engineering Foundation, New York, the latest booklet of a series on this subject. The Alloys of Iron Research was recently organized by the Foundation for the purpose of investigating iron and its combinations in steels, cast and wrought iron. A critical review of literature, research for basic data and consideration of all varieties of iron for all users is included in the plans.

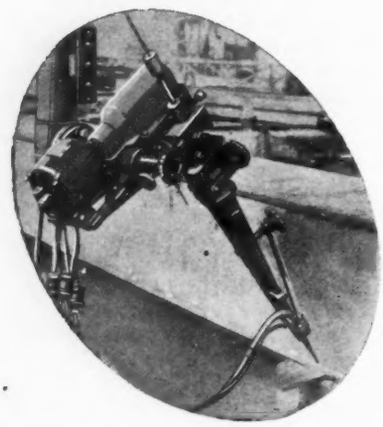




Building Cranes with G-E Automatic Arc Welders

TO MEET the increasing demand for its arc-welded cranes, the Cleveland Crane & Engineering Co. of Wickliffe, Ohio, installed two G-E automatic arc welders as shown above.

Fig. 1 shows the travel equipment which supports the welding generators, control panels, and automatic heads. Fig. 2 shows the equipment at work on an 86-ft. girder for a 10-ton crane. The equipment can lay a perfect weld 125 ft. long and at a speed of 32 ft. per hour.



Close-up of one of the two automatic arc-welding heads

After a year of successful operation, the manufacturer reports the following results: A lighter, stronger, simpler, more rigid product; increased production per unit of floor area; saving in time of designing and manufacturing; improved engineering; less waste material; increased productivity of operators.

Ask your nearest G-E office for further information concerning this installation and our complete line of automatic arc-welding equipment.

JOIN US IN THE GENERAL ELECTRIC PROGRAM, BROADCAST EVERY SATURDAY EVENING ON A NATION-WIDE N.B.C. NETWORK

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GENERAL ELECTRIC

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Reviews Nature of Forces Acting on Mill Bearings

FIVE methods for determining the bearing loads on roll-neck bearings now are available, according to a report of the special research committee, iron and steel division, American Society of Mechanical Engineers, submitted at the fourth national meeting, Chicago, Sept. 25, by J. H. Hitchcock, research associate of the committee and associated with the Carnegie Institute of Technology, Pittsburgh. In reviewing the nature of the forces, which occur in rolling mills, the speaker cited the difference between hot and cold rolling of steel, mentioning that the hardness of steel is much greater at low temperatures than at usual temperatures of hot rolling. Consequently, much higher average pressures are encountered in cold rolling than in hot rolling which results in deformation or flattening of the rolls to a considerable extent.

Internal Friction Is Factor

The influence of compression rate upon the average pressure is due to the internal friction, or viscosity, of the bar being hot rolled, the speaker stated. Steel above the critical range of temperature where all hot rolling is being done resists change of shape in the same manner as tar, and its resistance is increased with the rapidity with which the change is produced. The compression rate is a measure of the rapidity with which the change is produced. The resistance to change, or internal friction, he explained, increases with increasing compression rates; and since the force due to internal friction must be overcome by rolling pressure, the latter also increases. For values of compression rates equal to or greater than about 5 per second, the average pressure remains sensibly constant. This probably is due to the fact that at high compression rates the bar being rolled is heated considerably, and thereby softened, by the compression.

Test data showing the effect of internal friction as a separate and distinct factor from external friction are difficult to obtain, he stated, because each of these friction effects is present in some degree in every case.

In discussing average pressures encountered in cold rolling the speaker mentioned that the modulus of elasticity of the roll has an indirect effect upon the average pressure. A roll, which has a low modulus of elasticity, he pointed out, will have a greater deformation and a greater length of contact than a roll which has a high modulus of elasticity, all other effects being equal. Increasing the length of contact produces increased friction between the rolls and the bar, with the result that the average pressure also must be increased.

It is believed that when a bar is rolled in a continuous mill and is subjected to tension between successive stands, the average pressure will be less than that which is found under corresponding conditions in a single stand. The reason for this belief, the speaker stated, is that the tension in the bar acting in a direction opposite to that of the external friction force, cancels a portion of that force and thereby reduces the average pressure. However, when tension in the bar is used to draw the bar through the rolls of a single stand, and the rolls are driven solely by the friction between them and the bar the average pressure appears to be approximately the same, for corresponding conditions, as that which is found in a single stand where rolling is done without tension.

Control of Heat Required

When sawing steel cold, the heat developed is not an aid to the cutting and must be kept within limits, whereas when sawing steel hot, the heat must be created at a rapid rate to insure successful cutting. This fact was brought out by A. B. Pearson, engineer, Carnegie Steel Co., Munhall, Pa., in speaking on the "Design and Construction of Hot Saws for Cutting Heavy Sections." Among the advantages of the sliding frame saw mentioned by the speaker the most important is that the saw frame is outside and adjacent to the table on which the material is moved to sawing position. This permits a ready means for the disposal of crop ends and scrap into a pit located immediately under the table. The frame also lends itself equally well for sawing either hot or cold steel.

In directing attention to the importance of cooling saw blades when sawing cold steel, the speaker mentioned that an excessive amount of water flowing down with the saw blade to the line of contact will retard the cutting and also produce a hardened surface at the ends of the material being cut. This hardness, he pointed out was found to be from 45 to 80 Shore scleroscope, and difficulties were experienced when ends of beams had to be machined.

Failure of a saw blade generally is due to cracking at the nicked edge, the crack starting at the periphery and continuing in a more or less radial line toward the center. The cause may be laid to a number of variables such as homogeniety of material, method employed when machining the saw blade, cross section, quality of material being cut, and the cooling of the saw blade while cutting. Other factors such as the tensioning of the saw blade and the rate of feed are important items which at present are left to the operator's skill.

Belt-Type Less Efficient

From test data submitted by the speaker, belted saws require approximately 40 to 45 per cent more power to cut a given beam than does the direct motor-driven type of saw. In sawing, however, the actual cutting time generally is only a small fraction of the running time, and this has to be considered in making such a comparison.

The hot sawing action of steel essentially is a rubbing, heating and tearing action. The necessary rubbing to create sufficient heat for sawing depends on any prior heat in the steel to be sawed, the feed pressure, the speed of the saw blade and the continued cooling of the edge of the blade. Hot sawing of steel is possible when the friction between the steel to be sawed and the saw blade exceeds the tensile strength of the heated steel at a distance from the saw blade equivalent to the thickness of the chip.

Philadelphia Men Register For Heat Treating Course

The courses in heat treatment and metallography of steel to be conducted by the Philadelphia chapter of the American Society for Steel Treating during the 1930-31 season have attracted exactly 100 registrations. Those taking the course include principally employes of companies in the Philadelphia district in whose operations heat treatment is an important factor. The classes in this course are held at the College of Liberal Arts and Sciences, Temple university, Philadelphia.

Coal Cleaning Increases

Bituminous coal cleaned mechanically in 1929 reached a new high total with 37,143,000 tons being cleaned, or an increase of 29 per cent over the year preceding, according to figures furnished the department of commerce Washington, by bituminous coal operators. Pneumatic cleaning registered an extraordinary increase, 54.3 per cent, and wet washing of all types registered a gain of 25.2 per cent. Pneumatic methods accounted for 15.7 per cent of the total and wet methods for 84.3 per cent with jigs as the dominant type of the wet methods.

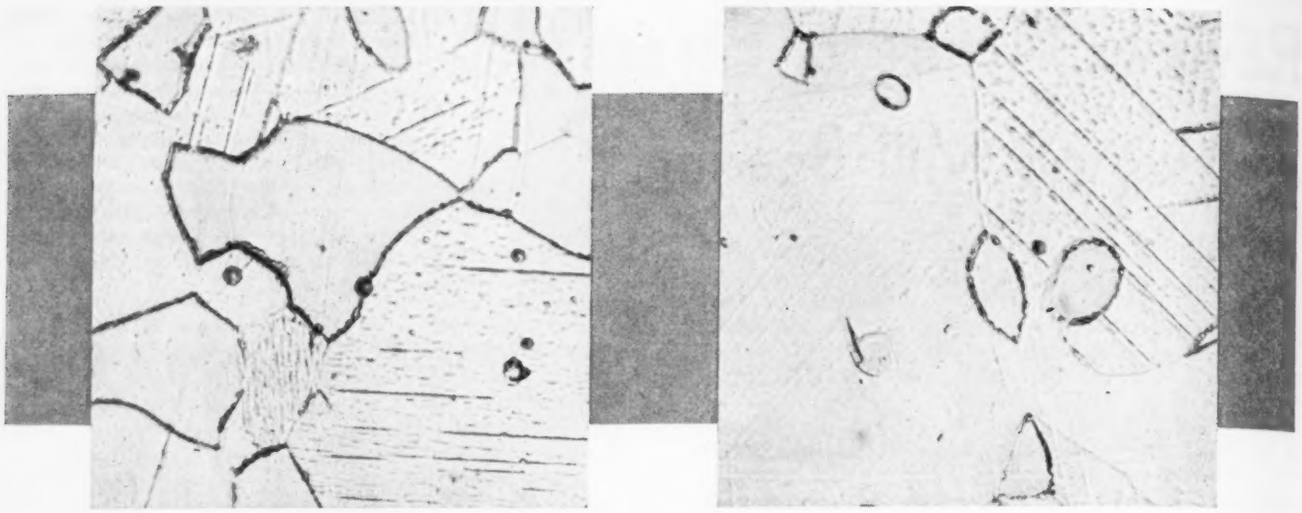


Fig. 1 (Left)—A chromium-manganese steel containing 0.26 per cent carbon, quenched from 2100 degrees Fahr. and showing austenite and ferrite. X1000. Fig. 2 (Right)—Carbon content raised to 0.29 per cent; small ferrite areas have diminished in extent. X1000

Manganese a Stabilizer for Austenitic Structure

THE following comment by M. A. Grossmann, vice president, Republic Research Corp., Canton, O., is a discussion offered in connection with the paper, "Chromium-Manganese Steels," by Dr. F. M. Becket, vice president, Electro Metallurgical Co., New York, presented at the spring meeting of the American Iron and Steel institute. Dr. Becket's paper appeared on Page 53 of the May 15 issue of IRON TRADE REVIEW, *predecessor to* STEEL.

FOR those interested in the structure under the microscope and in the magnetic properties of chromium-manganese steels it is perhaps useful to point out that heats of these steels which are low in carbon are not wholly austenitic and they are therefore magnetic. Indeed the function of manganese in these steels has to do, not so much with inducing the austenitic, nonmagnetic structure, as it has with stabilizing this structure when it is induced by other elements particularly carbon. The four accompanying illustrations bring out this point.

Fig. 1 shows a steel containing about 18 per cent chromium and 7½ per cent manganese with 0.26 per cent carbon. The photomicrograph at 1000 diameters shows the steel in the condition quenched from 2100 degrees Fahr. and shows a mixture of austenite and ferrite. This steel is strongly attracted by a magnet. With about the same alloy composition but increasing the carbon from 0.26 to 0.29 per cent, we find the structure of Fig. 2, which shows mostly austenite with only a few remaining areas of ferrite. This steel is still somewhat attracted by a magnet.

If the carbon content is again increased, this time from 0.29 to 0.32 per cent, we find the structure of Fig. 3, which is austenitic and al-

(*Concluded on Page 73*)

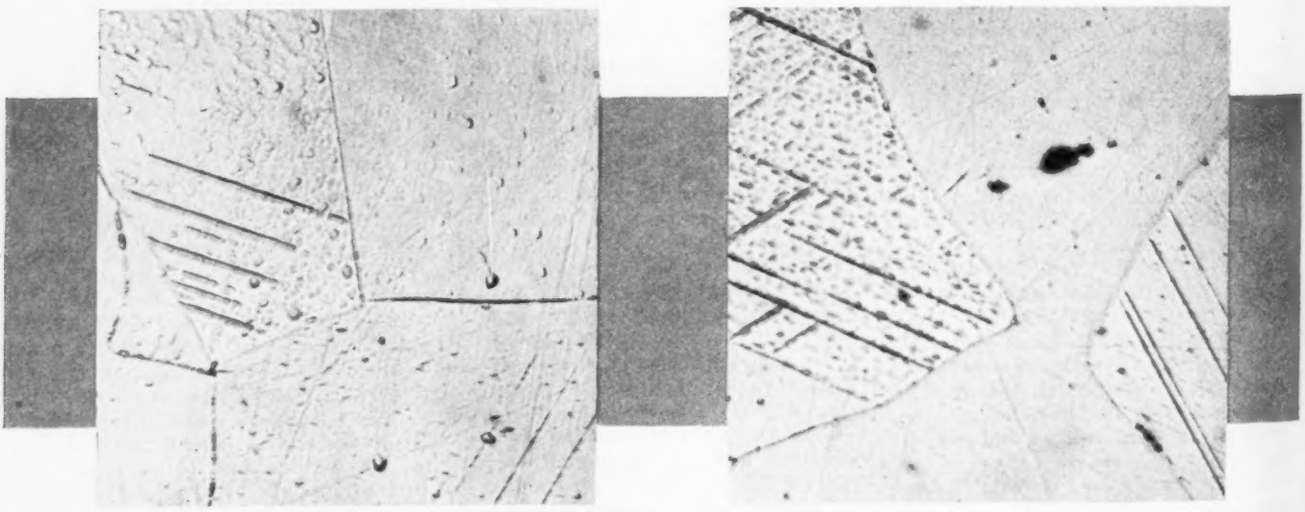
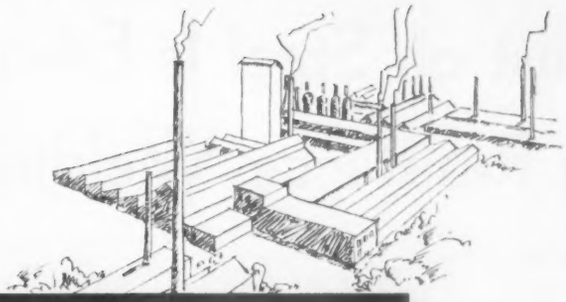


Fig. 3 (Left)—The same steel with carbon content raised to 0.32 per cent. Structure is austenitic and almost completely nonmagnetic. X1000. Fig. 4 (Right)—Carbon content again raised, this time to 0.36 per cent; structure entirely austenitic. X1000

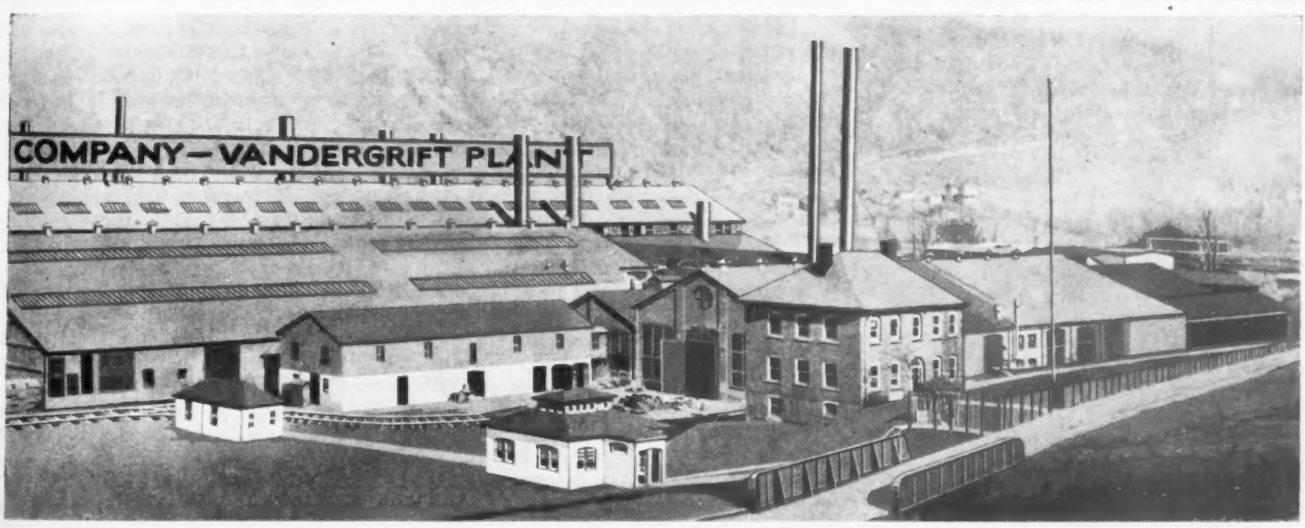
STEEL CASTINGS



A shipment from the United Steel Foundry of just a few of the massive steel castings required for the World's Largest Continuous Plate Mill, which is now being erected in United machine shops.

Hub for 21' 4" P. D. x 6' 3" F. Gear. Weight 82,100 pounds

Shear Housing. 15' 10½" x 22' 2". Weight 151,100 pounds



UNITED

ENGINEERING & FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Rust on Steel Is Essential in Resistance Welding

EXPERIENCE shows that if metals held loosely are heated the rough surfaces, covered with a layer of scale, will absorb heat unevenly. If, on the other hand, the pressure between the bases of the metal is too great the metal will be distorted and weakened. These facts were brought out by Frank Burton, Steel Joist institute, Detroit, in discussing "Resistance Welding of Bar Joists," before the recent meeting of the American Welding society in Chicago Sept. 22-26. In speaking of pressures and current densites, the speaker stated in a general way that there should be from 200 to 300 kilowatts of current available for each square inch of surface to be welded and that the pressure should be betwen 8000 and 10,000 pounds per square inch of weld. The time may be varied to obtain satisfactory weld and usually is found to be between a fifth second and one and one-half seconds.

The strength of weld metal in welds of steel joists is difficult to determine accurately, the author contended, for the reason that these joints are designed to resist shearing stresses and usually are so large in proportion to the bar connected that the connected members pass their elastic limit long before the weld fails. The weld then acts as a notched section and no accurate analysis of the stresses is possible.

Surface Need Not Be Clean

It is neither necessary nor desirable that the surface of the metal be clean, according to the author. Sheets of steel, which have been freed from all rust by pickling in acid cannot be welded by the resistance method. A slight coating of rust or other foreign matter appears to be essential in the resistance process of welding steel joists as it causes a pronounced localizing of heat at the point of contact. The metal must not be badly rusted or scaled but should have a thin, uniform coating of rust such as is normally present on commercial bar stock.

• C. A. Adams, Harvard Engineering school, Cambridge, Mass., in discussing this paper pointed out that rust makes little difference if a round piece is being welded to a flat section because it is squeezed out but that it was detrimental in the case of two flat sections on account of the danger of its becoming trapped.

Most of the so-called cost figures used in connection with welding are not absolute but merely are indicators of cost, according to Robert E. Kinkead, consulting engineer, Cleveland, who spoke on the "Cost of Using Welding." The factor obtained by adding labor, material and overhead is an indicator of this kind, he stated. Absolute cost in the economic sense involves service behavior and life of the product. In the case of welded products, the labor, material and overhead factor is an adequate indicator of real cost. Scientific predictions may be made of service behavior and life and the factor obtained which may be called the factor of use.

Cost Indicator Is Necessary

The cost indicator already in use cannot be abandoned, the speaker emphasized. It may be used as a yardstick from day to day or month to month performance of a production organization but under the conditions to which the American industry is subjected in 1930, an additional cost indicator is needed which is based on economic value of the product as obtained from life tests, he concluded.

P. J. Morgan, General Electric Co., Schenectady, N. Y., in discussing Mr. Kinkead's paper, mentioned that welding costs embrace welding engineering and cost accounting and that the welding industry must be satisfied with the present cost indicator which is based on material, labor and overhead. J. W. Owens, engineering director, Welding Engineering & Research Corp., New York., declared that saving in welding costs starts with design. The moment welding is introduced into a plant, it becomes a managerial duty to coordinate all departments to conform with this art.

Approximately 95 per cent of all airplane welding is done by gas. This fact was revealed by H. L. Whittemore, bureau of standards, Washington, in speaking on "Strength of Welded Joints in Tubular Members for Aircraft," a report prepared in collaboration with W. C. Brueggeman, bureau of standards, Washington. The speaker presented considerable information on the strength, weight and cost of a number of types of welded joints of value to the aircraft industry. For joints in chromium-molybdenum tubing ranging in size from ¾-inch outside diameter by 0.065-inch wall thickness, welded under pressure control by the oxyacetylene process, the result is sharply defined about ½-inch from the weld center. Here the material may have strength ranging between 80,000 to 100,000 pounds per square inch in tension and from 70,000 to 95,000 pounds per square inch in compression.

For T-joints loaded to high bending stresses near the joint it probably is more satisfactory to gain strength by increasing the size of the tube rather than by adding plates, straps, etc., the speaker declared. Reinforcements by means of U-straps increase the efficiency to 87 per cent according to the test results presented. Reinforcement for the lattice joint, either may be an inserted plate or a strap welded around the joint. Both methods increase the strength of the unreinforced joint about 20 per cent. While gusset plates are used for reinforcements a decided gain in strength is obtained by inserting one plate in all tubes rather than welding several plates in the angles between the tubes, the speaker concluded.

Equipment required to arc weld aluminum is similar to that used for welding other metals, stated W. M. Dunlap, metallurgist, Aluminum Research Laboratories, Oakmont, Pa., in speaking at the initial technical session on "Arc Welding of Aluminum." On account of the metallic arc being unstable, the rods are flux coated to supply the necessary stabilizing element. A coating ranging from 0.02 to 0.03-inch is satisfactory. In describing the procedure for welding aluminum plates the speaker mentioned that the movement of the electrode may be made forward or backward at a uniform rate but never across the weld. At present, he stated, 14 gage is the maximum thickness of a sheet that can be welded by the arc process.

Preheating Is Unnecessary

In the discussion of this paper the author made it plain that preheating of fairly heavy aluminum castings uniform in cross section is unnecessary, but that it is advisable to clean out sand from cavities before undertaking the weld. Where welding is done on airplane motor castings, the pieces always are preheated, according to R. R. Moore, Wright Aeronautical Corp., Paterson, N. J. Welding never is employed on any parts in aircraft construction subjected to vibration, according to Mr. Moore, nor it is used for closing blowholes in castings principally because it does not improve the strength of the casting. When blowholes are encountered, he stated, they are sealed by soldering to improve the appearance.

In speaking on "Welding of Stainless Steel," L. W. Hostettler, Allegheny Steel Co., Brackenridge, Pa., mentioned that straight chrome iron is magnetic, responds to heat treatment, has a slightly less expansion coefficient than steel and has a higher electrical resistance than medium carbon steel. Steel known as 18 and 8 has an expansion coefficient 1½ times that of medium carbon steel, is immune to heat treatment and has a thermoconductivity only one-half that of wrought iron. Straight chrome irons can be welded by both the electric carbon arc and the oxyacetylene processes, he explained, but in the latter

process it is necessary to use the best type of equipment, a slightly reducing flame to secure porosity and jigs and chill plates. Annealing is accomplished best by heating the material to 1425 degrees Fahr., air cooling, heating to 1500 degrees, bringing back and finally tempering.

In electric welding the metal arc is not practicable on sheets under 14 gage. Moreover, he stated, a medium to short arc gives a sounder weld than a long arc. A coated rod is necessary in electric welding arc welding stainless steels, the analysis of the weld metal being 17 to 20 per cent chromium, 7 to 10 nickel and 0.1 per cent carbon.

Extra chromium in the rod is essential to compensate for that lost in the welding operation. In conclusion, the speaker mentioned that little progress has been made in vertical and overhead welding of these alloys.

Oxyacetylene Method Outlined

"Oxyacetylene Welding of Corrosion-Resisting Steel" was discussed from a metallurgical and practical standpoint by W. B. Miller, metallurgist, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y. The speaker indicated the type of steels best suited for welding by this method and the precautions and technique to be employed.

Before a meeting of the structural steel welding committee, H. M. Priest, vice chairman of the committee and assistant chief engineer, American Bridge Co., New York, submitted a progress report on the group's recent activities. The speaker showed by slides a birdseye view of the work accomplished, pointing out that 1008 of the 1677 intended specimens have been tested in an endeavor to obtain the strength of fabricated joints welded by different methods.

Immediately following this meeting the American Bureau of Welding convened and approved certain changes of by-laws and received progress reports of committees on rail joints, pressure vessels, boiler codes, fundamental research, welding wire specifications and standard tests of welds.

Manganese a Stabilizer for Austenitic Structure

(*Concluded from Page* 68)

most completely nonmagnetic. The same condition obtains in the case of Fig. 4, which contains 0.36 per cent carbon.

Here we see manganese acting in the role of stabilizing the austenitic nonmagnetic structure, that structure having first been induced by the carbon, and then preserved in the quench by the manganese.

Estimated costs for buildings in 291 comparable cities were 16.2 per cent lower in August than in July.

Steel Constructors Plan Technical Program

Addresses by James A. Farrell and E. P. Thomas, president and vice president, respectively, United States Steel Corp., New York, and E. W. Beatty, president, Canadian Pacific Railway Co., Montreal, Canada, constitute principal features of the program for the annual meeting of the American Institute of Steel Construction Inc., at the Carolina hotel, Pinehurst, N. C., Oct. 28-Nov. 1, The program also contains subjects of a technical and economic nature of importance to the structural steel industry.

Technical papers to be presented and a partial list of business sessions are as follows:

Tuesday, Oct. 28

MORNING

Address of Welcome, by O. Max Gardner, governor, State of North Carolina.
President's address, by Charles N. Fitts.
Reports of committees and officers including executive director and chief engineer.

AFTERNOON

Report of the director of engineering service, by F. H. Frankland.
"The Structural Steel Industry and Its Future Possibilities," by R. I. Ingalls, president, Ingalls Iron Works Co., Birmingham, Ala.
"Economic Business Conditions and Their Relation to the Structural Steel Industry," by Frank Parker, professor of finance, Wharton School of Finance and Commerce, Philadelphia.
"Why Structural Steel Should be Nationally Advertised," by J. G. Shryock, Belmont Iron Works, Philadelphia.

Wednesday, Oct. 29

MORNING

"Economics of Highway Bridge Construction," by T. W. Dodd, president, St. Joseph Structural Steel Co., St. Joseph, Mo.
"Bridge Construction," by P. J. Freeman, chief engineer, bureau of tests and specifications, department of public works, County of Allegheny, Pittsburgh.

AFTERNOON

"The Contractors' Bond as Related to the Structural Steel Industry," by Edward H. Cushman, Philadelphia. (Tentative).
"Code of Trade Practice and Its Enforcement," by R. B. Thomas, counsel to the committee on code of trade practice, New York.
Showing of Hudson river bridge film, described by, Edward W. Stearns, assistant chief engineer, Port of New York Authority, New York.
Showing of institute film on battledeck floor.

EVENING

"What I Saw and Heard in Europe," by George E. J. Pistor, Hay Foundry & Iron Works, New York.
"Promoting Steel Consumption in Germany," by Otto von Halem, director, German Steel Syndicate. Showing of film, "Stahl Ueberal."

Thursday, Oct. 30

MORNING

Construction symposium.

EVENING

Annual banquet. Toastmaster, President Charles N. Fitts. Speakers, James A. Farrell, president, United States Steel Corp., New York, E. W. Beatty, president, Canadian Pacific Railway Co., Montreal, Canada, and E. P. Thomas, vice president, United States Steel Corp., New York.

Friday, Oct. 31

MORNING

"The Value of Research Being Conducted by the Trade Promotion Bureau of the United States Steel Corp. and Its Relation to the Work of the Institute," by C. O. Hadly, secretary, Trade Research bureau, Pittsburgh.
Report of Mill Relations committee, by H. A. Fitch, chairman, Kansas City Structural Steel Co., Kansas City, Kan.

Dividing Line Separates Two Grades of Gray Iron

The dividing line between ordinary gray iron and high test gray iron may be placed at about 30,000 pounds per square inch tensile strength, 2500 pounds transverse breaking load, with a deflection of 0.25-inch on the standard arbitration test bar, according to an opinion expressed by Dr. Richard Moldenke, Watchung, N. J., speaking at a roundtable meeting of the American Electrochemical society in Detroit, Sept. 25-27, the subject being electric furnace gray iron. However, in actual production these values are considerably higher and with alloy additions tensile strengths of over 50,000 pounds per square inch may be obtained.

The use of small cupola charges, such as 500-pound charges in a 54-inch cupola, was advocated by Dr. Moldenke, if the best physical properties in gray iron are to be had. In this connection, though, an instance was cited of the adoption of a 12-000-pound charge in the cupola to overcome a variation in silicon in individual pigs which ran as high as 2 per cent.

An inquiry was made as to the availability of rapid methods for determining the physical properties of gray iron in continuous melting. One method suggested was the use of a chill test bar and a carbon determination where only one type of iron was produced. Another method was the brinell hardness value which has been found to give excellent results on production castings.

Speakers present indicated that gray iron with a tensile strength around 60,000 pounds per square inch can be obtained consistently without the use of alloys in the electric furnace. One speaker stated that by use of the electric furnace gray iron with a tensile strength of 40,000 pounds per square inch was obtained regularly from all scrap mixtures. The metal was tapped around 3000 to 3100 degrees Fahr., and the furnace lining served for 1100 heats of 2000 pounds and over, with normal patching costs.

Plant of William Campbell Co., Alliance, O., manufacturer of electrical novelties, was recently sold at auction.

Safety and Reliability

Today these two factors are of utmost importance in all industries. You cannot afford hazards to your workmen nor delays in plant operations. Northern Cranes are serving scores of industries and meeting the demands for safety and reliability.

Let your next selection be a Northern Crane, and in the meantime permit us to tell you about the latest developments in their design and construction.

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NORTHERN ENGINEERING WORKS

DETROIT MICHIGAN

CA-10

Scanning the Technology of Steel

A Digest of Important Developments in Scientific Research, Engineering Progress and Operating Procedure Pertaining to the Production, Processing, Application and Performance of Steel

USES:

Stainless Steel

Uses of high-chromium and high-chromium-nickel steels discussed by E. S. Mills, in United States Steel Quarterly, Autumn number 1930, *p.* 34, 2 *pp.*, 1 *illust.*

Application of stainless steel in the chemical, automotive, building construction, oil refining, milk and dairy and paper industries are enumerated and other fields, which promise large developments for stainless commodities, are suggested.

—STEEL 10-9-30

Tradenames of Alloys

A list of tradenames covering various alloys in the ferrous and nonferrous field arranged alphabetically, in Machine Design, September 1930, *supplement.*

The list is a complete revision of the original directory of iron, steel and nonferrous alloys which was presented in the January issue of this publication. It has been brought up to date in co-operation with producers of alloys and includes the trade marks of 200 alloys, their analysis, application and the name and address of the manufacturer.

—STEEL 10-9-30

Refractories

Recent developments in refractories capable of withstanding temperatures beyond the standard range of fireclay and similar materials, summarized in Chemical & Metallurgical Engineering, September 1930, *p.* 589, 2½ *pp.*, 2 *illusts.*

Zircon material is resistant to thermal shock and withstands sudden heating and cooling in periodic, intermittent operations requiring rapid heating and cooling. A combination of chromium oxide and silica will resist acid and alkaline slags. High-alumina refractories are being used for lining the burning zone of a majority of rotary kilns, for calcining dolomite and lime, and for reburning lime sludges in the paper and chemical industries. Recent uses of carbon as a refractory include furnace linings and slag floors in high-pressure boiler furnaces where pulverized coal is fired. The enameling industry uses alumina refractories in lining heavy-duty enameling furnaces. The ceramic industry has adopted the material for saggers. Lately both high alumina and silicon carbide refractories have been used to resist high temperatures in venturi muffles and in the furnace for tubular heaters in oil cracking operations.

—STEEL 10-9-30

FABRICATION:

Welding Practice

Methods employed at a large shipbuilding company, discussed by W. T. Dimm, in Manufacturers Record, September 25, *p*, 41, 4½ *pp.*, 10 *illusts.*

Gas cutting operators and mechanics' helpers are taught to make strong, tight welds in all positions. Designers are taught how to make use of welding for safe, economical joints by personal instruction by the use of standards and by lectures. The use of welding in hull construction and in repair and reconditioning of ships, hydraulic machinery, etc., is explained in detail.

—STEEL 10-9-30

Welding Steel Structures

A group of six articles setting forth design, erection and inspection practices on some recent major building projects, in Engineering News-Record, Sept. 18, 1930, *p.* 442, 8 *pp.*, 16 *illusts.*

The use of welded connections in steel building construction began in 1926 with the completion of a 5-story building at the Sharon, Pa., plant of the Westinghouse Electric & Mfg. Co. Fusion welding had proved successful prior to this, but its use had been confined to laboratory tests and minor practical applications. The Sharon building was the first structure to be designed expressly to suit welded construction. This symposium considers the design and erection problems on the highest all-welded office building, erected in Dallas, Tex.; the inspection of field-welding of structural steel; a rational method of welded connection design; the construction of a large area of welded steel floor in a Pittsfield, Mass., garage; the welding of field joints on a 14-story office building; and arc-welding facts that should be common knowledge.

—STEEL 10-9-30

PRODUCTION:

High-Frequency Furnaces

Present status of the high-frequency induction steel furnace, surveyed by D. F. Campbell, in Foundry Trade Journal (Institute of British Foundrymen), September 18, *p.* 197, 2¼ *pp.*, 2 *tables*, 5 *illusts.*

There appears to be no technical reason to prevent the construction of these type units of any size that is commercially practicable, though economic considerations indicate the probability that units of less than 15 to 25 tons will be adopted. Equipment incorporated in a new foreign steelworks includes large heroult electric furnaces for the refining of basic steel and high-frequency furnaces for remelting rolling mill scrap without substantial alteration of composition thus affording the advantages of a pure steel finished in an acid lining. The author cites melting speeds and power consumption and discusses the method of operating induction furnaces.

—STEEL 10-9-30

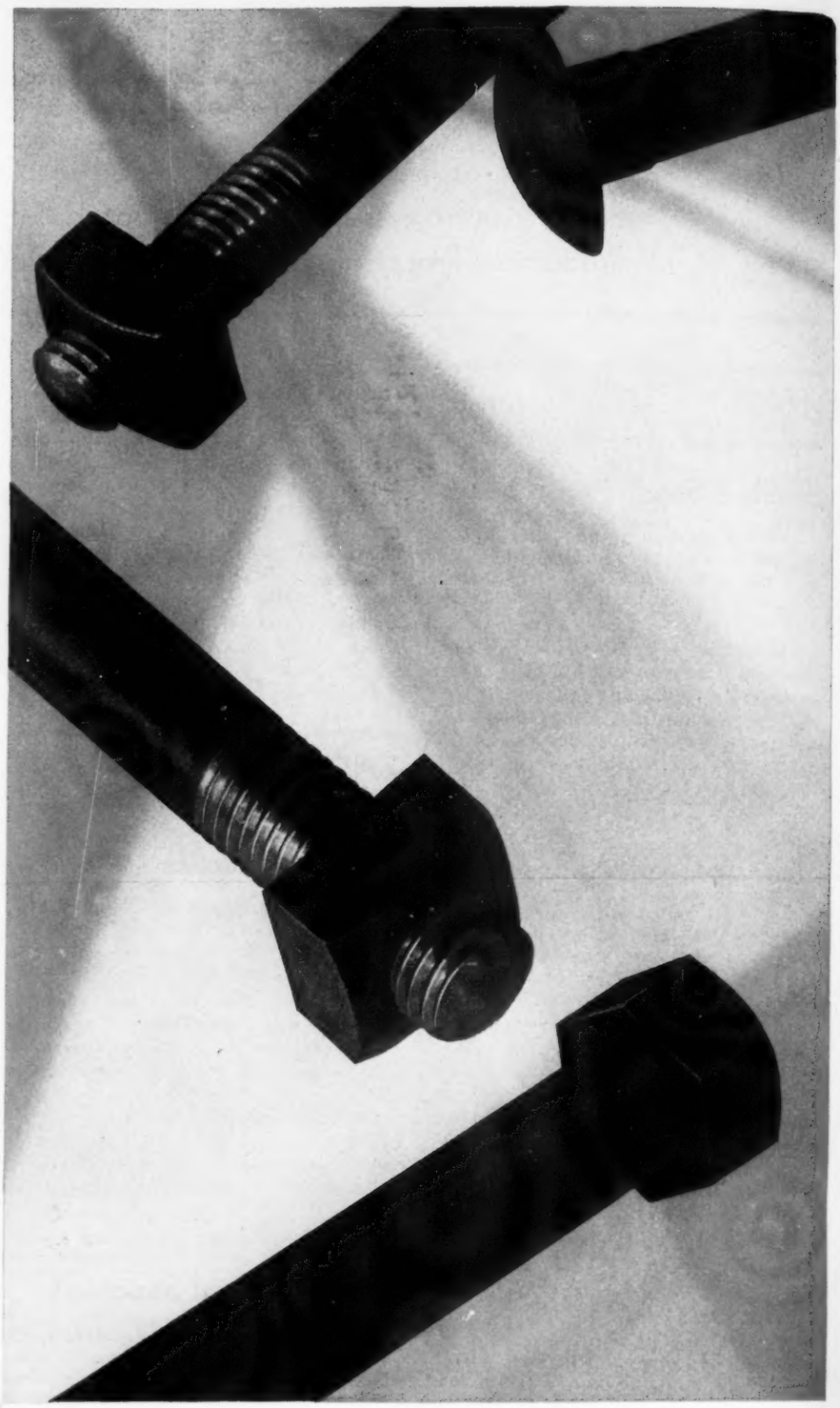
Scientific Foundry Practice

Need of the technician in the foundry industry to solve production problems, stressed by E. O. Keator, in The Foundry, October 1, *p.* 109, 2¾ *pp.*

Foundrymen must take stock and find out why they have no one in their organization competent to apply scientific principles to practical problems. A few examples of unsolved problems having to do with machine molding, various types of patterns, gating, etc., are cited by the author in his plea to foundrymen to make haste in employing the technician as a means of meeting competition.

—STEEL 10-9-30

It takes experience... to make bolts like these



In Chicago, in Birmingham, in Cleveland and Kent, Ohio—Lamson&Sessions operate plants making the most complete line of bolt and nut products in the world. In these great plants are machines which are the first of their kind—machines which enable Lamson & Sessions to make better bolts than was believed possible a short time ago.

But just as important as modern plants and machinery are the many years of bolt-making experience now gathered into one great business. Only long experienced and highly skilled men can produce bolts and nuts of Lamson quality. Characteristic of Lamson bolts is an outward appearance that speaks plainly of a high standard of accuracy and strength before you verify it with "mike" and wrench.

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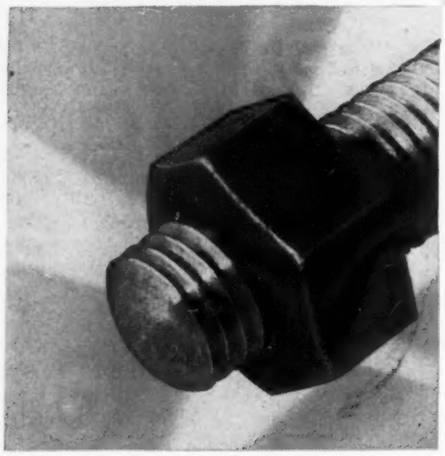

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Machine Tools and Plant Equipment

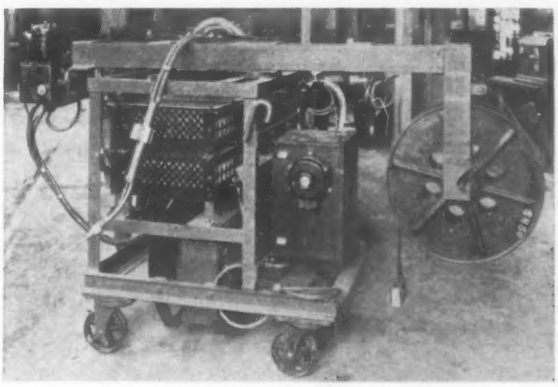
"Without machine tools modern machinery could not be built."

—Joseph W. Roe

Threading Machine Embodies Accurate Lead Screw

Murchey Machine & Tool Co., Detroit, has brought out a new machine for the cutting of precision threads on production work at minimum cost. This machine, of which an illustration appears herewith, makes use of an opening die head or a collapsing tap as the actual thread cutting element, but it does not depend upon the lead of the chasers to feed the tool. Instead, a hardened and ground lead screw, accurate to 0.0001 inch, is mounted directly on the spindle and relieves the chasers of all work aside from the actual cutting. According to the manufacturer, this results in threads which are entirely free from chatter marks, even when the speed of cutting is pushed to the limit of the chasers. At the same time, the life of the chasers is increased materially.

New portable semi automatic welder operates either with open or shielded arc and is recommended where hand welding is too slow and full automatic apparatus not easily applicable



Drive and Lubrication

The machine is of the horizontal variety with built-in motor drive. A 3-horsepower motor running at 1800 revolutions per minute is used to drive the machine proper, and a ¼-horsepower auxiliary motor running at 1800 revolutions drives the cutting and lubricating oil pumps and the return worm shaft. Lubrication is by a combination force and flood system and cutting compound is delivered to the working points by pumping it through the spindle. Cutting and lubricating oils are segregated in separate reservoirs in the base.

The cycle of operation is as follows: The machine is started by pressing a button on the left-hand side; by raising a hand lever the segmental nut sections are engaged with the lead screw, causing the spindle to move forward and the thread to be cut; by means of adjustable stops, chasers and nut segments are automatically thrown open at the instant when the predetermined length of thread has been cut, and at the same time a ball thrust bearing comes into action to return the spindle to starting position, ready for the repetition of the cycle. The machine can be set up for manual operation by removing the lead nut segments.

Threads Right or Left Hand

Magnetic reversing switches and combination right and left-hand drives in the spindle and die head are provided, making it possible to shift from right hand to left hand threading simply by changing chasers, lead screw and lead nut segments. Pick-off gears allow selection of correct threading speeds for different diameters of work. The spindle is driven by two hardened and ground rollers which rotate in longitudinal grooves 4 inches from the center line of the spindle. Antifriction bearings are used throughout the machine.

By means of a hardened and ground lead screw mounted directly on the spindle, this production threading machine relieves its chasers of all feeding load, thereby insuring threads of unusual smoothness and accuracy at maximum cutting speed

Portable Welder Provides Open or Shielded Arc

General Electric Co., Schenectady, N. Y. announces an improved portable, semiautomatic arc welding outfit to be used for either open or shielded arc welding. This apparatus, of which an illustration appears herewith, needs only a simple adjustment requiring but a few minutes to change it from the open to the shielded arc.

The equipment consists of a welding head for feeding the electrode, an enclosed line contractor with interlock and a field rheostat for controlling the motor on the welding head, as well as a welding tool and lead for directing the electrode toward the work.

What's MADE of Allegheny Products?

ALLEGHENY METAL is our only product—so the public thinks. But the public is *wrong*.

The seasoned steel man knows. He's acquainted with Allegheny Electrical Sheets . . . and how they've been the criterion of quality for a generation.

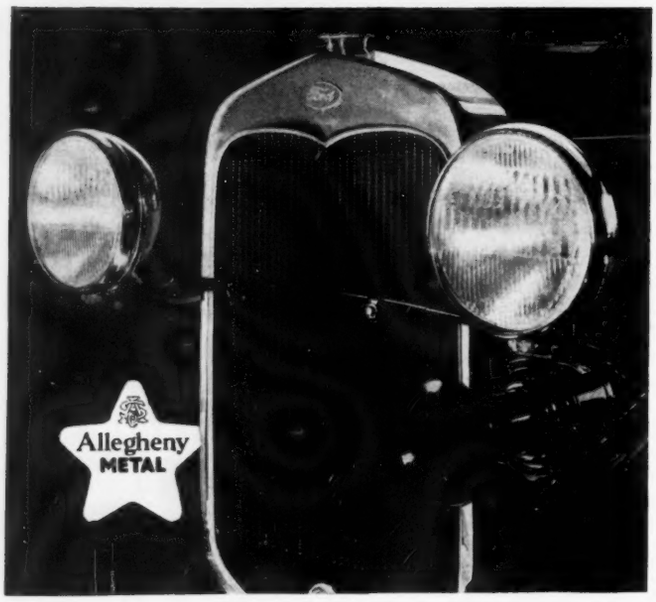
The steel man knows our years of experience making Allegheny furniture sheets. And all our other products.

He knows every one of our products pictured in use on these pages. The six steels and four alloys. Look at the pictures and read their descriptions. They show ten typical uses—ten out of thousands—for Allegheny Products.

ALLEGHENY STEEL COMPANY

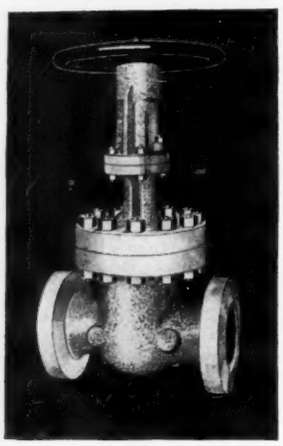
Brackenridge, Pa. . . *Offices:* New York, Buffalo, Chicago, Cleveland, Detroit, St. Louis, Milwaukee, Los Angeles. *Warehouse Stocks:* Joseph T. Ryerson & Son, Inc.—Chicago, Cleveland, Milwaukee, St. Louis, Cincinnati, Detroit, Buffalo, Boston, Jersey City, Philadelphia. In Canada: Samuel & Benjamin, Ltd., Toronto.

ALLEGHENY METAL



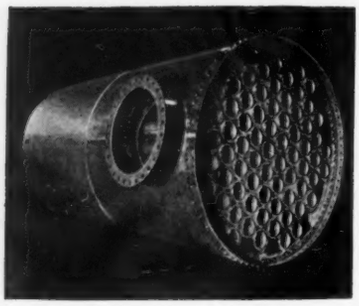
The new Ford body types are trimmed with Allegheny Metal because it is unrusting, unstaining, untarnishing . . . it cleans as easily as glass . . . it's far stronger than mild steel . . . it resists more corrosive agents than any other metal available.

ASCOLOY 33



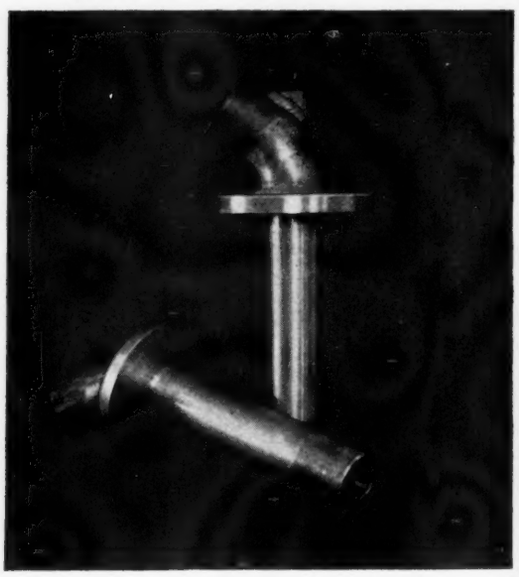
Valves of Ascoloy 33 withstand progressive corrosion . . . this alloy fabricates easily.

ASCOLOY 44



Heat exchangers are made of Ascoloy 44 because it withstands temperatures up to 2100° F. . . . it resists many corrosives.

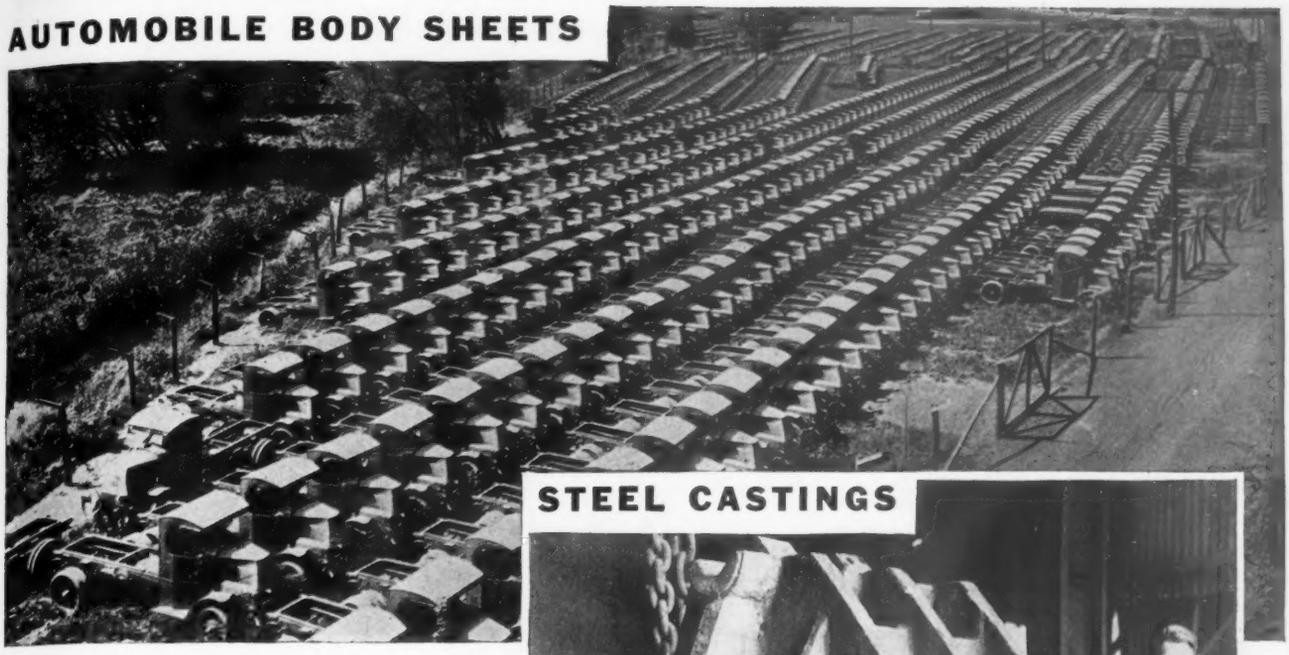
ASCOLOY 55



These furnace nozzles are of Ascoloy 55 . . . this alloy is used for temperatures to 2150° F. . . . it resists many corrosive agents . . . not recommended for difficult fabrication.

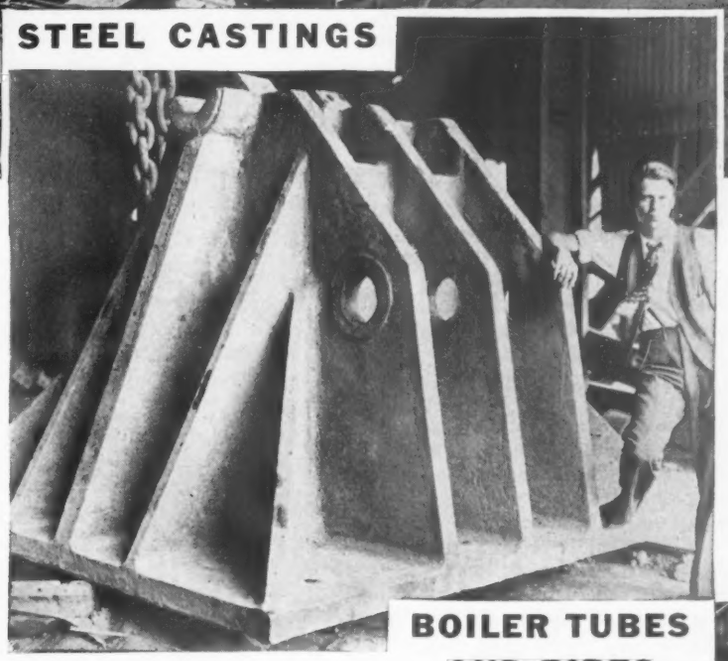
ALLEGHENY ALLOYS

AUTOMOBILE BODY SHEETS



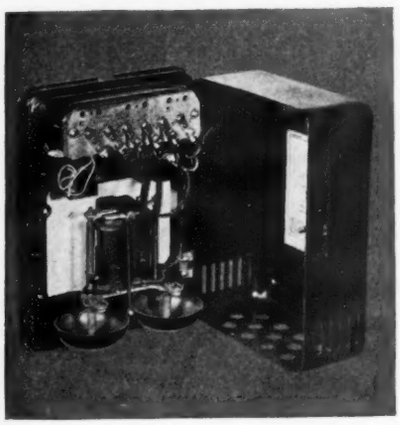
Many autos and trucks are made with Allegheny automobile body sheets . . . 25 years' experience . . . sizes up to largest ever used.

STEEL CASTINGS



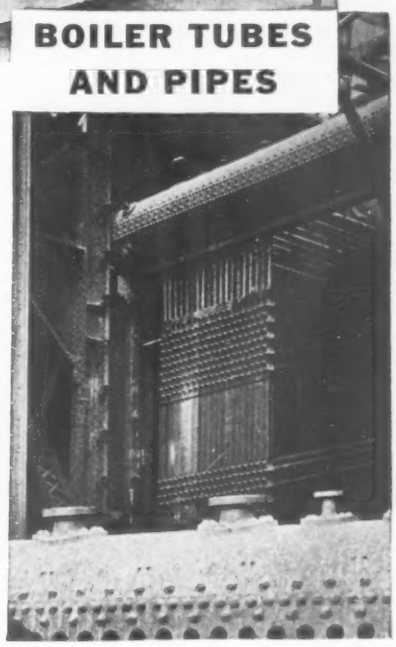
This bridge pedestal (33,000 pounds) cast by Allegheny foundries . . . 25 pounds to 25 tons capacity . . . most modern equipment.

ELECTRICAL SHEETS



All kinds of electrical uses employ Allegheny electrical sheets . . . 30 years' experience . . . world's largest manufacturer.

BOILER TUBES AND PIPES

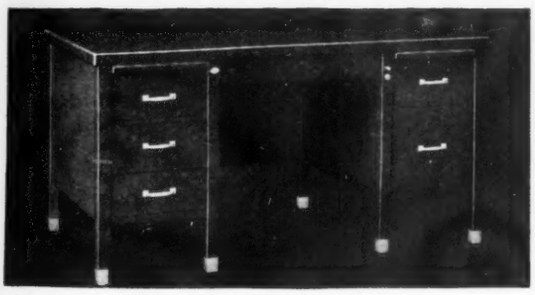


Allegheny boiler tubes for stationary, marine and locomotive boilers . . . made of open hearth steel . . . sizes 2" to 6" O.D. Pipe 2" to 6" inclusive, lap-welded.

SHEETS FOR DEEP DRAWING

Telephone industry uses tons of deep-drawing sheets . . . Allegheny offers full range of sizes and gauges.

METAL FURNITURE SHEETS



Allegheny Metal furniture sheets go into thousands of desks, files, etc. . . 25 years' experience assures uniformity . . . known for better surface and flatness . . . rolling largest sheets produced.

ALLEGHENY STEELS

The welding head is simply a motor-driven wire feeding device to supply electrode wire continuously to the arc. The wire is drawn from a reel by means of a pair of geared feed rollers propelled through a train of gears by an adjustable speed, 60-volt, direct-current motor. The head is equipped with a gear shift for obtaining approximately the required rate of wire speed, the final adjustment being made by means of the motor field rheostat.

Features of Operation

The welding tool and lead consists of a 10-foot insulated flexible conduit with handle and nozzle so that the operator can direct the electrode at the work. A tumbler switch in the handle permits the operator to close or open the line contractor, starting the feed motor in operation. When it is desired to weld with the shielded arc it is merely necessary to change two nozzle accesories. The rate of electrode feed can be adjusted for various sizes of wire. Although the equipment is mechanically capable of handling a 3/16-inch electrode, it is not recommended that wire larger than 5/32 inch be used. Either a constant energy or a constant potential welding set can be used as the source of current. The welding head control, however, requires a 60-volt constant potential source of power.

This equipment is recommended for applications where hand welding is too slow and where full automatic apparatus cannot easily be applied. The continuous feeding of the electrode eliminates the time lost in changing electrodes in a hand welding apparatus. When the shielded arc is used, the weld is surrounded by an atmosphere of hydrogen which, by minimizing formation of oxides and nitrates, insures a more ductile joint.

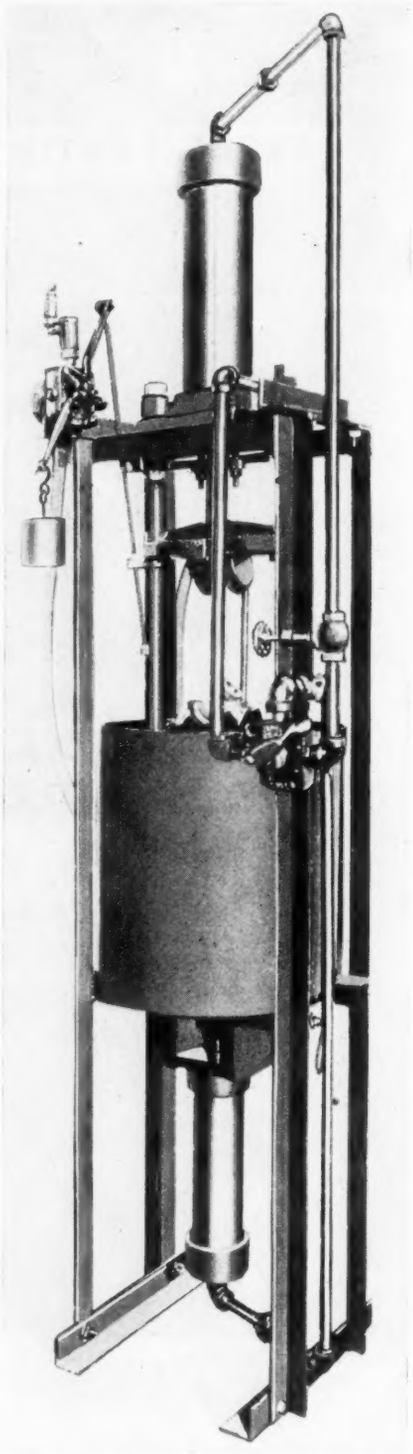
◆

Hydro-Pneumatic Machine Tests Pipe Fittings

Watson-Stillman Co., 75 West street, New York, has brought out a hydro-pneumatic machine for rapidly testing pipe fittings of brass, cast iron, malleable iron, cast steel, etc. The machine, an illustration of which appears on this page, will handle all sorts of fittings, including 45 and 90-degree elbows, street elbows, tees, crosses and return bends, in sizes up to 1½-inch.

The fitting to be tested is placed in a die on the lower platen of the machine, and by the operation of a valve on the right of the machine the top double-acting piston on its down stroke clamps the fitting in the dies and forces the fitting under water in the tank. While the fitting is held below the surface of the water by the 90-pound pressure in the clamping cylinder, air pressure is automatically turned on by the valve at the left of the top of the frame which subjects the fitting to internal air pressure of 50 pounds per square inch. This constitutes the test.

Reversal of the valve at the bottom returns the top piston to loading position, while the bottom piston lifts the fitting out of the water and releases the air pressure. The fitting is then removed and the machine is ready for the next test.



Internal air pressure under water tests pipe fittings in this machine

Eliminates Wasted Machining

Fittings can be tested either before or after tapping at speed of 500 to 600 per hour. The use of this machine on fittings before they are machined eliminates wasted time by causing the scrapping of defective castings before production work is started.

◆

New Aluminum Welding Rod Overcomes Cracking

Oxweld Acetylene Co., 205 East Forty-second street, New York, announces a new welding rod which is recommended for welding either aluminum sheet or castings when the metal is held tightly in jigs, and therefore not free to move. At temperature just below the melting point, aluminum casting alloys possess little strength and have a high contraction coefficient. The combined effect of these two properties under certain conditions will cause cracks to occur adjacent to welds.

The new welding rod is recommended for welding these alloys because of the fact that its melting point is lower than that of the metal being welded, so that it will remain in the molten state after the base metal has solidified. The weld metal therefore will fill voids created by the solidification and contraction of the base metal. Any stresses which might be caused by contraction therefore will shift their effect from the base metal to the weld metal which, being free from hot shortness, will absorb the stresses without the development of cracks.

The manufacturer claims that this new welding rod will coalesce readily with all aluminum alloys and that it possesses high strength and good corrosion resistance. It is available in three sizes, 1/16, ⅛ and ¼-inch.

New Magnetic Clutches

The heading of an illustrated description of the new line of magnetic clutches manufactured by Cutler-Hammer Inc., Twelfth and St. Paul avenue, Milwaukee, which appeared on Page 64 of Sept. 25 STEEL, should have been, "Magnetic Clutches Feature Ease of Installation."

Ingot, Pig Iron Rates Fall Sharply

September Levels Lowest Since 1924—Recent Improvement in Sentiment May Vanish — Demand Generally Is Slacker —Tin Plate Is Reduced $5—Scrap Easy

COINCIDENT with a flattening-out of the gently rising curve in demand for finished steel and pig iron comes the disclosure that the production of steel ingots and pig iron declined sharply last month, to the lowest level in six years for both.

Apparently, the gains in demand reported by most producers through September were met by shipments from stock or represented obligations against which buyers have not yet specified. No small portion of this coverage appears to have been protection at current low prices.

A deflation of the improved sentiment of recent weeks undoubtedly will result from the combination of receding production and the loss of momentum in buying. This week, as last week, there has been more talk of holding recent gains than of bettering them.

Ingot production had declined from March to July, then advanced slightly in August to 119,050 gross tons daily, but in September sank to 110,307 tons, a level not plumbed since September, 1924. To Oct. 1 the 1930 output of steel was 32,689,869 tons, against 43,353,909 tons in record 1929. The steelmaking average for September was 55.1 per cent; for 1930 to date 70.08 per cent.

This 7.6 per cent drop in the daily ingot rate in September was slightly larger than the 6.8 loss in pig iron. September's daily rate of 75,893 gross tons compares with 81,455 tons in August. The 9-month total for 1930 is 25,744,941 tons; for 1929, 32,682,700 tons. At the close of September only 126 stacks were in blast, 11 fewer than on Aug. 31.

Appraising steel and iron requirements by industries, a standoff is revealed. Automotive and gas, oil and water consumers are lethargic, with no indications of revival this quarter. Structural activity, on the other hand, is well maintained for the season, and the railroads, while shunning the equipment market, are beginning to place 1931 track material.

Pere Marquette has distributed 13,650 tons of rails, with the Great Northern reported closing on 10,000 tons and the Northern Pacific 5000 to 6000 tons. The Santa Fe is inquiring for 62,000 tons. Chicago Great Western has ordered 15 locomotives; the Baltimore & Ohio is considering 50. September freight car awards, at 535, were the lowest this year, bringing orders for nine months to 35,557, barely half the 70,528 of a year ago.

Structural steel awards spurted this week to 26,483 tons, compared with 14,387 tons last week and 22,315 tons a year ago. For 1930 to date structural orders total 1,447,828 tons, 15 per cent behind 1929. Low prices continue an incentive to prospective builders and much work is on architects' boards. Five thousand tons for a nickel refinery at Copper Cliff, Ont., was the week's largest award.

Moderate general demand for bars, alloy steel, sheets, strip and wire fails to offset the slack releases from automotive consumers. Better jobber buying of wire is reported at Chicago. Bolt, nut and rivet demand is higher in most districts. Tin plate, reduced $5 per ton to the lowest price since 1923, is expected to develop first-half needs promptly.

Of the raw materials, pig iron is quieter, coke and semifinished material are unchanged, scrap is in slack demand and tending easier. It now appears that the 1930 lake movement of iron ore will not exceed 49,000,000 tons, compared with 66,166,637 tons last year.

Steelmaking operations are unchanged this week at 55-57 per cent for Chicago, 55 for Pittsburgh, 58 for eastern Pennsylvania, 50 for Cleveland and 48 for Birmingham. Youngstown mills are off a point, to 52-53, while Buffalo is down two points to 51 per cent. The industry as a whole is at about 54 per cent this week, against 55 last week.

Pig iron prices are unchanged this week. Semifinished material and such finished products as bars, plates, shapes, sheet, strip and wire—constituting the great bulk—are moderately firm, but the $5 per ton reduction in tin plate drops STEEL's market composite 20 cents, to $32.32, the lowest in a decade.

Composite Market Averages

Based on Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe.

This week (Oct. 8, 1930)	**$32.32**
Last week (Oct. 1, 1930)	**32.52**
One month ago (September, 1930)	**32.65**
Three months ago (July, 1930)	**33.21**
One year ago (Oct. 1929)	**36.23**
Ten years ago (Oct. 1920)	**68.61**

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Oct. 8, 1930	Sept., 1930	July, 1930	Oct., 1929
PIG IRON				
Bessemer, del. Pittsburgh	$19.76	20.13	20.46	20.76
Basic, valley	17.00	17.75	18.20	18.50
Basic, eastern del. eastern Pa.	17.75	17.90	18.00	19.75
No. 2 foundry, del. Pittsburgh	18.76	19.13	19.46	19.76
No. 2 foundry, Chicago	17.50	17.50	17.90	20.00
*Southern No. 2, Birmingham	14.00	14.00	14.00	14.00
**No. 2X, Virginia furnace	18.25	18.25	18.25	18.25
**No. 2X, Eastern del. Phila.	19.76	19.76	20.26	22.26
Malleable, valley	18.00	18.35	18.70	19.00
Malleable, Chicago	17.50	17.50	17.90	20.00
Lake Superior, charcoal, del. Chi.	27.04	27.04	27.04	27.04
Gray forge, del. Pittsburgh	18.13	18.50	18.83	19.13
Ferromanganese, del. Pittsburgh	103.79	103.79	103.79	109.79

*1.75 to 2.25 silicon. For local delivery. Northern shipments based on $12 to $13, Birmingham. **2.25 to 2.75 silicon.

COKE				
Connellsville furnace, ovens	2.60	2.60	2.50	2.65
Connellsville foundry, ovens	3.50	3.50	3.50	3.75
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngs.	31.00	31.00	31.00	35.00
Sheet bars, open-hearth, Pitts.	31.00	31.00	31.00	35.00
Billets, open-hearth, Pittsburgh	31.00	31.00	31.00	35.00
Wire rods, Pittsburgh	36.00	36.00	36.00	40.00

	Oct. 8, 1930	Sept., 1930	July, 1930	Oct., 1929
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.60	1.60	1.70	1.90
Steel bars, Chicago	1.70	1.70	1.80	2.05
Steel bars, Philadelphia	1.89	1.89	1.94	2.22
Iron bars, Chicago	1.75	1.75	1.90	2.05
Shapes, Pittsburgh	1.60	1.60	1.65	1.95
Shapes, Philadelphia	1.76	1.66	1.66	2.01
Shapes, Chicago	1.70	1.70	1.75	2.05
Tank plates, Pittsburgh	1.60	1.60	1.65	1.95
Tank plates, Philadelphia	1.80½	1.80½	1.85½	2.15
Tank plates, Chicago	1.70	1.70	1.75	2.05
Sheets, blue anl., No. 13, Pitts.	2.15	2.10	2.15	2.35
Sheets, black, No. 24, Pitts.	2.45	2.40	2.55	2.80
Sheets, gal., No. 24, Pittsburgh	3.00	3.00	3.15	3.50
Sheets, black, No. 24, Chicago	2.60	2.60	2.70	3.05
Sheets, blue anl., No. 13, Chicago	2.30	2.30	2.30	2.50
Sheets, galvanized, No. 24, Chi.	3.25	3.25	3.35	3.70
Plain wire, Pittsburgh	2.30	2.30	2.30	2.40
Wire nails, Pittsburgh	2.00	2.00	2.10	2.45
Tin plate, per base box, Pitts.	5.00	5.25	5.25	5.35
SCRAP				
Heavy melting steel, Pitts.	14.75	15.70	14.90	17.30
Heavy melting steel, eastern Pa.	13.00	13.00	12.50	15.80
Heavy melting steel, Chicago	12.00	12.25	12.00	14.45
No. 1 wrought, eastern Pa.	14.25	14.25	14.25	16.00
No. 1 wrought, Chicago	11.25	11.25	11.25	14.85
Rails for rolling, Chicago	14.50	14.50	14.50	17.05

Sheets

Prices Only Moderately Steady as Specifications Are Not Expanding—Auto Demand Light

SHEET PRICES, PAGE 85

New York—Following a profound dullness depressing sheets, blue annealed plates are now 1.95c to 2.00c, Pittsburgh. Blue annealed sheets are 2.10c to 2.15c. Black are easier at 2.40c to 2.45c and galvanized 3.00c to both jobbers and the general trade.

Philadelphia—Bookings from radio manufacturers show some increase, otherwise demand is quiet and unchanged with no signs of sustained improvement. Blue annealed jobbing sheets continue firm at 2.00c and 2.15c. Black sheets are firm at 2.45c, Pittsburgh, for common quality, but usual concessions are offered on high extra finishes. Galvanized is generally 3.00c, Pittsburgh.

Pittsburgh—Improvement in new sheet business during October so far has failed to be followed by a similar pickup in specifications. Orders continue at the quiet rate of preceding weeks but in view of the tonnage involved in new contracting, producers look for some quickening in orders this month. New business in September for the leading interest was the largest since April. Prices generally are unchanged with black sheets continuing 2.45c, galvanized 3.00c to 3.10c and blue annealed plates 2.00c. Autobody remains in a nominal market. Automotive tonnage continues distinctly light. Mill operations continue about 50 per cent.

Youngstown, O.—Common black sheets are quoted 2.45c, Pittsburgh; galvanized, 3.10c; autobody sheets, 3.50c to 3.60c, and blue annealed, 2.25c. More cheerful tone in the sheet market is due to more liberal offerings from general manufacturing lines. September business exceeded August. While new business from the automotive interests is not expanding, it holds steady.

Cleveland—Sheets continue their quiet march toward betterment. August for some mills was approximately 6 per cent better than July, and September was 25 per cent better than August. So far October is not showing any gain over the September rate but is expected to hold its own. Fisher Body is releasing more tonnage each week and by Oct. 10 expects to have all dies on hand for the new model Chevrolet. Austin is slowing up at Butler and is taking less steel than a few weeks ago. Some autobody sheets still are 3.50c, Pittsburgh, although an effort is being made to establish 3.60c. While some makers insist that their minimums on black and metal furniture are 2.45c and 3.70c, Pittsburgh, respectively, 2.35c and 3.60c are recurrent. The lowest price noted recently on galvanized was 3.00c. Some are quoting 3.10c. Blue annealed are 2.00c and 2.15c, respectively, for No. 10 and No. 13 gage.

Chicago—Few tonnage orders in sheets are appearing. Mills report barely perceptible gains in specifications. Galvanized roofing business in the Southwest and some of the general manufacturing lines in the Chicago district are leading. Mill quotations are reported unchanged here at 2.55c for No. 24 black, 3.20c for No. 24 galvanized, and 2.25c for No. 13 blue annealed. A leading independent producer has its 10 hot mills down at Milwaukee for an indefinite period, switching orders to its Indiana harbor works.

Cincinnati—Steady improvement in demand was reported for the fifth consecutive week by a leading sheet producer in this district whose operations are at about 53 per cent.

St. Louis—Past week has developed distinct improvement in buying. Character of recent orders reflects generally small consumer stocks. Betterment is noted chiefly in galvanized and blue annealed, while tin plate is up to seasonal average. Granite City Steel Co. reports incoming business during the third quarter larger than in 1929 or 1928. Shipments and unfilled orders, however, made a less favorable comparison. Prices are steady.

Current Finished Steel Prices

Prices in cents per pound unless otherwise stated

Steel Sheets

SHEET MILL BLACK, NO. 24

Pittsburgh base	2.45c
Detroit, delivered	2.76½c to 2.81½c
Philadelphia, delivered	2.74c
Gary, Indiana Harbor	2.55c
Chicago, delivered	2.60c
Birmingham, base	2.60c to 2.65c
St. Louis, del.	1.80½c

TIN MILL BLACK, NO. 28

Pittsburgh, base	2.70c to 2.80c
Gary, base	2.90c to 3.00c

GALVANIZED NO. 24

Pittsburgh, base	3.00c to 3.10c
Philadelphia, delivered	3.29c
Gary Indiana Harbor	3.20c
Chicago, delivered	3.25c
Birmingham base	3.15c to 3.20c
St. Louis, del.	3.45½c

BLUE ANNEALED SHEETS NO. 13

Pittsburgh, base	2.15c
Chicago, district mills	2.25c
Chicago, delivered	2 30c
St. Louis, delivered	2.50½c
Philadelphia, delivered	2.44c
Birmingham	2.30c

BLUE ANNEALED PLATES, NO. 9-10

Pittsburgh, base	2.00c
Chicago, district mills	2.10c
Chicago, delivered	2.15c
Philadelphia, delivered	2.29c
St. Louis, delivered	2.35½c
Birmingham	2.15c

AUTOMOBILE NO. 20

Pittsburgh base	3.50c

FURNITURE NO. 24

Pittsburgh	3.60c to 3.70c

Tin and Terne Plate

Prices per 100-pound box Pittsburgh

Tin plate, coke base	5.00

Gary, Ind., base 10 cents higher.

Long ternes, 24, primes	3.55c

Wire Products

(To Jobbers-Merchant Trade)

F.o.b. Pittsburgh, Cleveland base
(Per 100 pound keg)

Standard wire nails	$2.00 to 2.15
Cement coated nails	2.00 and 2.10
Galvanized nails	4.00 and 4.10

(Per pound)

Polished staples	2.45c and 2.55c
Galvanized staples	2.70c and 2.80c
Barbed wire, gal.	2.65c and 2.75c
Annealed fence wire	2.15c and 2.25c
Galvanized wire	2.60c and 2.70c

Woven wire fencing, retailers, Pittsburgh-Cleveland, net ton $65.

(To Manufacturing Trade)

Plain wire, 6-9 gage	2.30c
Spring wire	3.30c
Wire, delivered Detroit	2.53½c
Nails, delivered Detroit	$2.38½

Joliet, DeKalb, Waukegan, Ill., Anderson, Ind., Chicago, $1 over Pitts.-Cleve.; Duluth and Worcester, Mass., $2 higher; Fairfield, Ala., $3 higher.

Rivets

Struc. c.l., Pitts.-Cleve.	2.75c
Struc., c.l., Chicago	2.85c
**7/16-inch and smaller, Pitts.	70, 10 and 5 off
Chi., Cleve.	70 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Steel Plates

Base, Pittsburgh	1.60c
Philadelphia, del.	1.80½c
New York, del.	1.88c
Boston, del.	2.05c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.78½c to 1.88½c
Lackawanna, N. Y., base	1.80c
Birmingham, base	1.80c to 1.85c
Coatesville, Pa., base	1.70c
Pacific Coast, c.i.f.	2.05c to 2.15c
St. Louis, del.	2.00½c

Structural Shapes

Base, Pittsburgh	1.60c
Philadelphia, del.	1.76c
New York, del.	1.75½c to 1.85½c
Boston, del.	1.88½c to 1.98½c
Chicago, base	1.70c to 1.75c
Cleveland, delivered	1.83½c to 1.88½c
Lackawanna, N. Y.	1.80c
Birmingham, base	1.80c to 1.85c
Pacific Coast, c.i.f.	2.15c to 2.25c
Detroit, del.	1.91½c to 1.96½c

Bars

SOFT STEEL

Pittsburgh, base	1.60c to 1.65c
Chicago, base	1.70c to 1.75c
Birmingham, base	1.80c to 1.85c
Lackawanna, N. Y., base	1.85c
Pacific Coast, c.i.f.	2.25c to 2.35c
Cleve. base, local del.	1.65c
Do, outside delivery	1.60c
Philadelphia, del.	1.89c to 1.94c
New York, delivered	1.98c
Boston, delivered	2.05c
Pittsburgh, cold finish	1.80c
Pittsburgh, forg. qual.	1.90c

RAIL STEEL

Chicago Heights	1.65c
Eastern mills	1.65c

IRON

Chicago, base	1.75c
New York, delivered	1.93c to 1.98c
Philadelphia, delivered	1.89c to 1.94c
Pittsburgh, refined	2.75c to 4.25c

REINFORCING

Pitts., billet cut lengths	1.90c to 2.00c
Stock lengths, mill	1.65c to 1.75c
Chi. billet, over 500 tons	1.70c to 1.85c
30 to 200 tons	2.00c
Under 30 tons	2.45c to 2.85c
Chi., rail steel, over 30 tons	1.50c
Under 30 tons	2.10c to 2.50c
Philadelphia, cut lengths	2.04c to 2.09c

Cold-Finished Steel

Bars, Pitts., Chi., Buff., Cleveland	2.10c
Do, delivered, Detroit	2.20c
Shafting (turned, polished) Pitts., Buffalo	2.10c
Do, (turn., ground) mill	2.45c to 2.90c

Corrosion, Heat Resist. Alloys

Base, Pittsburgh

18 per cent chrome, 8 per cent nickel

Sheets, 35c; plates 31c; bars 28c

	A	B	C	D
Bars	19c	20.5c	23c	28c
Plates	22c	23.5c	26c	31c
Sheets	26c	27.5c	30c	35c
Hot strip	19c	20.5c	23c	28c
Cold strip	28c	29.5c	32c	37c

Carbon 0.12 and under; no nickel. A has chrome 15% and under, B over 15/18% inc., C over 18/23% inc., D over 23/30%.

Wrought Washers

Carloads, Pitts. dist.	$6.50 to $6.75 off
Carloads, Chicago dist.	6.70 to 6.80 off

Alloy Steel

Hot Rolled—F.o.b. Mills

Alloy Quality Bar Base is 2.65c

S.A.E	Alloy Diff.	S.A.E	Alloy Diff.
2000	0.25	1.25-1.75 Ni.	1.05
2100	0.55	5100 .80-1.10 Cr.	0.45
2300	1.50	5100 Chr. spring	0.20
2500	2.25	6100 bars	1.20
3100	0.55	6100 Spring	0.95
3200	1.35	Chr., Ni., Van.	1.50
3300	3.80	Carbon Van.	0.95
3400	3.20	9250 (flats)	0.25
4100 .15 to .25 Mo.	0.50	9250 (rds., sq.)	0.50
4600 .20-.30 Mo.			

Strip, Hoops, Bands

Hot strip, to 6-in., Pitts.	1.70c to 1.75c
Hot strip 6 1/16 to 24-in., Pitts.	1.60c to 1.65c
Hot strip, bands 6 in. and under, Chicago	1.85c
Do, 6 1/16 to 24 in.	1.75c
Cooperage hoop, Pitts.	1.90c to 2.00c
Do, Chicago	2.00c to 2.10c
Cold rolled strip., Pitts., Cleve., 3 tons, over	2.35c to 2.45c
Worcester, 3 tons, over	2.60c to 2.70c

Rails, Track Material

Standard bess. and open hearth rails, mill	$43.00
Relay rails, Pitts., 60 to 90 lb.	$24.00 to 28.00
Light rails, 25-45, mills	$34.00
Angle bars, Chi. base	2.75c
Spikes, railroad, mills	2.80c
Spikes, railroad, 7/16-in. and smaller, Pitts.	2.80c
Spikes boat, barge, Pitts	3.00c
Spikes, railroad, Chi.	2.80c
Track bolts, Pitts., steam roads	3.80c
Do. standard, jobbers	73 off list
Track bolts, Chicago	3.80c
Tie plates, mills	$41.50

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham and Chicago

Discounts to legitimate jobbing or large consuming trade for full-case lots apply to May 10, 1930, lists.

CARRIAGE BOLTS

All sizes, cut thread ..... 73 off

Rolled thread ⅜ x 6 and smaller take 10 per cent lower list.

Eagle list ..... 73 off

MACHINE BOLTS

All sizes cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts without nuts ..... 73 off

Tire bolts, 60, 10 and 10 off.

Stove bolts, 80, 10, 10, 5 off in pkgs.; 80, 10, 5, 2½ off in bulk.

Rolled thread machine bolts, ⅝ x 6 and smaller take 10 per cent lower list.

NUTS

Semifinished ..... 73 off

***HEXAGON CAP SCREWS**

Milled ..... 80-10-5 off

Upset 1 in. diam. and smaller ..... 85-10 off

***SQUARE HEAD SET SCREWS**

Milled ..... 85-5 off

Upset 1 in. and smaller ..... 80-10-5 off

*Discounts dated Jan. 23, 1930

Cut Nails, Chain, Piling

Cut nails, c.l., mills	2.45c
Do, less carloads	2.55c
Chain, BB, BBB, 9/16-1½ in.	33 1/3 off
Sheet piling, Pitts.	2.00c

Bars

Recent Improved Demand Is Held—Prices Steady at Current Level—Production Rate Higher

BAR PRICES, PAGE 85

Chicago—Bar mill gains continue. Tonnage specified generally is in larger lots for quick shipment. Mills are holding prices to 1.70c, Chicago base, for soft steel bars, while discontinuing some preferred buyer classifications. For mixed carloads, sales at 1.75c, Chicago, have become more common. Bar mill operations remain at about 60 per cent. Several tonnage orders have been closed for fourth quarter. The character of buying reveals the depleted state of consumer inventories. A large automotive parts maker placed tonnage in this district, the first for that buyer in some weeks. Belief here is that automotive tonnage should hold its own for the remainder of the year.

New York—Steel bars are showing moderate strength at 1.65c, Pittsburgh, fully 85 per cent of current business here appearing to be going at that level. Demand has increased slightly. There are no stocks at consumers' plants and buying is for immediate turnover.

Philadelphia—Steel bar demand shows no further increase and the market continues at 1.60c to 1.65c, Pittsburgh, with occasional concessions.

Pittsburgh—Steel bar business holds at approximately the rate of recent weeks. Business shows a moderate improvement since 30 days ago, restricted by light requirements of the automotive industry. Producers are endeavoring to firm the market and usually quote 1.65c on new business although 1.60c still is going on some tonnage.

Youngstown, O.—A general line of inquiry for bars is lending hope of improvement in the rate of mill operations shortly. All makers in this district are holding strictly to 1.65c, Pittsburgh, and less is heard in competition of the former minimum of 1.60c.

Cleveland—Merchant steel bar orders are increasing. Not alone are mills competing on price but are taking orders by meeting competitive 24 to 48-hour rollings. As a result customers are getting better service than usually is possible. Sales thus far in October are slightly behind September though October is confidently forecast to better the prior month. Bars are quoted 1.60c, Cleveland or Pittsburgh, for outside shipment, and 1.65c, Cleveland, for local delivery. Less has been heard recently on consumers' part to ask for extension of prices through first quarter, 1931. Prices are fairly firm. No outstanding tonnages in size are going.

Cold Finished Support from Auto Trade Is Down

Cold Finished Prices, Page 85

Pittsburgh—Specifications cold-finished steel bars and shafting are steady at the rate of the preceding several weeks. Automotive tonnage is tending downward and little improvement from that direction is looked for during the fourth quarter. Demand from other industries holds at a slightly better rate than a month ago. The market continues 2.10c.

Cleveland—Screw stock releases in cold-finished steel are beginning to show some improvement. Automotive tonnage is growing. Other consumers of cold-finished bars are taking small quantities. The price is 2.10c, Cleveland. Releases against contracts are commencing to be received in larger volume. Operations of cold finishers are about 50 per cent.

Silver plating by electrodeposition first was used in 1840.

Plates

Western Inquiry Swelled by Oil Tankage—Shipments for Pipe Slower—Prices Fairly Firm

PLATE PRICES, PAGE 85

New York—Plates appear fairly firm at 1.70c, Coatesville, and while there is little outstanding business, orders show a gain. Ship and railroad work is light, though the Baltimore & Ohio may enter the market soon for 50 locomotives, requiring approximately 2000 tons. Lock Joint Pipe Co., Ampere, N. J., manufacturer of concrete pipe, recently noted as low bidder, has been awarded the contract for 4500 tons of 42-inch pipe for Wilmington, Del.

Philadelphia—Plates continue 1.70c, Coatesville, Pa. The market tone is firmer and fewer concessions are being allowed on special business than some weeks ago. Eastern mills say demand is maintained at recent levels and operations continue about 55 per cent.

Pittsburgh—Activity in the plate market continues restricted by light demand from freight car and barge builders. Pipe mills continue busy on production of lapweld pipe, but tank makers are light buyers. Plates usually continue 1.60c, Pittsburgh.

Cleveland—Plate orders at present are confined mostly to single carloads, 50 or 100 tons at a time. Occasionally a larger amount is specified by a tank builder or a ship repair yard. Light plates for automobile frames are in good demand. No spectacular tonnage is pending. Plates are 1.60c, Pittsburgh.

Chicago—About 3000 tons has been added to oil tank plates inquiry from Oklahoma fields. Total tank inquiry is about 25,000 tons, with 3000 to 5000 tons active. Plate prices show strength as a result of tightening on small-lot purchases, 1.70c, Chicago, being the base for tonnage differentials. Shipments of plate skelp for pipe line production in the Milwaukee district continue at 10,000 to 12,000 tons weekly, but shipments may drop before the end of the month. A. O. Smith Corp., Milwaukee, producer of electrically welded pipe, reports its September shipments the heaviest in the company's history, at 89,800 tons, equivalent to 617½ miles.

Contracts Placed

2000 tons, plates and sheets for hollow metal work for General hospital, Los Angeles, to Hollow Metal Door Trim Co.

440 tons, tanks, Sinclair Refining Co., Wellsville, N. Y., to Hammond Iron Works, Warren, Pa.

260 tons, 55,000-barrel tank for naval operating base, San Diego, Calif.; general contract to R. E. Hazard Contracting Co.

200 tons, sheet piling, New York Telegram building foundations, West and Barclay streets, New York; George J. Atwell Co. Inc., general contractors.

160 tons, tanks, Gold Dust Corp., Baltimore, to Hammond Iron Works, Warren, Pa.

140 tons, tanks, Gold Dust Corp., St. Louis, to Hammond Iron Works, Warren, Pa.

Strip Mill Hit By Fire

Fire of unknown origin last week destroyed the initial unit of the Blair

Strip Steel Co., New Castle, Pa., comprising the shipping, pickling, stores, machine shop and the No. 1 cold finishing departments. Destruction included equipment in the annealing and electrical departments and eight 2-high, tandem cold strip mills. Cold rolling facilities, including a 16-inch tandem cold mill, in the No. 2 department built last year were unharmed.

Pending reconstruction of the mill, orders of the Blair company, including those for the Ford Motor Co. and General Motors Corp., will be filled by the Sharon Steel Hoop Co.

Semifinished Inquiries Small; Prices Hold Over

Semifinished Prices, Page 96

Pittsburgh—Semifinished steel continues in a quiet market. No inquiries of size are appearing and orders are limited to small lots. Producers continue to quote $31 for rerolling billets, slabs and sheet bars, with forging billets commanding $36. Wire rods continue $36.

Youngstown, O.—With strip and sheet mills in this district confined in their operations to satisfying imperative needs of consumers, sales of billets and sheet bar are limited and largely are for quick shipment. No buyer seems interested in forward requirements. Billets, sheet bars and slabs are quoted at $31, Pittsburgh and Youngstown.

Tin Plate Reduced $5; Lowest Since 1923

Tin Plate Prices, Page 85

Pittsburgh—Reduction of 25 cents per base box on tin plate to $5, Pittsburgh, and $5.10, Gary, announced by the American Sheet & Tin Plate Co., as effective Oct. 1, opens books for the first half of 1931 about 6 weeks earlier than usual and gives canmakers additional time for setting container prices for 1931. The new $5 price is the lowest since April, 1923, when the market was advanced from $4.95 to $5.50. Tin plate was $5.35 throughout 1929, having been advanced from $5.25 on Nov. 15, 1928. On Jan. 1, 1930, it was again reduced to $5.25 at which level it has continued until this time. Activity in tin plate continues to decline, with rush orders of August and September lacking. Mill operations, settled to around 60 to 65 per cent, are expected to remain fairly steady near this level during the remainder of the year.

Railroads

Pere Marquette Divides 13,650 Rail Order—Other Inquiry Soon —Cars Still Quiet

TRACK MATERIAL PRICES, PAGE 85

New York—Dullness still characterizes the car market. Baltimore & Ohio is reported to be contemplating the purchase of 50 locomotives, although no specifications have as yet been issued.

Preliminary estimates of domestic freight car business in September, involving 535 units, appear correct, establishing the total for the first nine months at 35,557 cars. Comparisons follow:

	1930	1929	1928	1927
Jan.	5,072	13,196	4,160	14,710
Feb.	17,027	15,944	10,220	5,960
March	6,118	12,023	2,958	4,955
April	1,997	8,205	6,043	3,675
May	1,392	7,562	2,531	5,425
June	998	5,886	2,422	7,440
July	1348	341	582	2,295
Aug.	1,070	2,854	677	1,181
Sept.	535	4,517	1,378	682
Total 9 mos.	35,557	70,528	30,294	46,323
Oct.	.....	19,506	2,853	886
Nov.	.....	6,361	6,140	1,189
Dec.	.....	9,710	4,799	14,897
Total	.....	106,105	44,763	63,295

Less than 100 domestic freight cars are actively pending. C. C. B. Smokeless Coal Co. awarded 150 mine cars to Sanford Day Iron Works, and 59 mine cars to Watt Car & Wheel Co.

Pennsylvania railroad will take bids Oct. 15 on three contracts ie., structural steel, boiler tubes and axles. This railroad has temporarily withdrawn about 175 tons for a bridge at New Brunswick, N. J., on which bids were recently taken.

Cleveland—Pere Marquette has ordered 13,650 tons of rails, including 3600 tons to Algoma Steel Corp., Sault Ste. Marie, Ont., 2000 tons to Bethlehem Steel Co., Bethlehem, Pa., 4000 tons to Illinois Steel Co., Chicago, 4050 tons to Inland Steel Co., Chicago. Mostly 110-pound rail is specified. It is reported, too, that Great Northern purchased 10,000 tons and Northern Pacific 5000 to 6000 tons.

Chicago—Inquiries for 62,000 tons of rails and about 20,000 tons of track fastenings have been issued by Santa Fe. Great Northern and Northern Pacific are understood to have placed about 15,000 tons. Rail mill operations, recently much reduced, will reach 50 per cent within a week, since it is expected some 1931 rail shipping orders will specify November-December delivery. Track fastenings releases are heavier. Sales of fastenings amounted to about 2500 tons. Rock Island and Chicago & North Western shops are down, but Chicago, Milwaukee, St. Paul & Pacific is augmenting its shop forces. Steel for car repair work is light for minor repairs to freight and passenger cars.

Birmingham, Ala.—Minor improvements are being made at rail mills and car works of the district. No indication, however, of early resumption of operations is given. First estimates on rail requirements of railroads are expected within the next week or two. Negotiations are reported under way for the first large tonnage by a southern railroad.

Car Orders Placed

C. C. B. Smokeless Coal Co., Charleston, W. Va., 150 mine cars to Sanford Day Iron Works, Knoxville, Tenn., and 59 mine cars to Watt Car & Wheel Co., Barnesville, O.

Rail Orders Placed

Great Northern, 10,000 tons of rails to unstated mill.

Northern Pacific, 5000 to 6000 tons of rails to unstated mill.

Pere Marquette, 13,650 tons, mostly 110-pound rail, allocated as follows: 3600 tons, to Algoma Steel Corp., Sault Ste. Marie, Ont., 2000 tons, to Bethlehem Steel Co., Bethlehem, Pa., 4000 tons, to Illinois Steel Co., Chicago, and 4050 tons to Inland Steel Co., Chicago.

Locomotive Orders Placed

Chicago Great Western, 15 locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Car Orders Pending

Maine Central, five 70-ton gondolas.

Swift & Co., 200 steel underframes for refrigerator cars.

Locomotives Pending

Baltimore & Ohio, 50 locomotives, contemplated.

Maine Central, two to four switch engines.

Rail Orders Pending

Santa Fe, 62,000 tons of rails.

Highland Resumes Work

Highland Iron & Steel Co., Terre Haute, Ind., subsidiary of American Chain Co., has begun full-time operations. The Highland company, which runs a bar iron mill, considered removal of the plant several months ago from Terre Haute, due to an unfavorable freight rate situation.

Structural Shapes

Lettings Increase More Than 50 Per Cent Over Last Week's Total—5000-ton Canadian Plant Leads—2000 Tons of Kentucky Bridges Placed — Bridges, Apartments Lead in Inquiries

STRUCTURAL SHAPE PRICES, PAGE 85

New York—Shape mills continue to take a firmer stand on prices in their effort to establish 1.70c, eastern mill, on plain material. Some tonnages have moved under this figure. It is generally felt the market is now undergoing its real test in the matter of steadier minimum prices. New York comes into the market in good volume. One large apartment builder, inactive since last fall, has four projects up, involving close to 4500 tons. Subway and bridge inquiry is active. Railroads are buying more bridge material. Baltimore & Ohio has 2350 tons up for a Potomac river bridge. American Bridge Co., through Post & McCord, will fabricate 1100 tons for the Seamen's Y. M. C. A.

Boston—Structural awards are scattered, few and far between. Small jobs aggregate fairly high. A plant at Pittsfield, Mass., for General Electric Co. will require 1500 tons.

Worcester, Mass.—Little activity is noted in structural steel. The award of 108 tons for a Harvard university dormitory is the only contract for more than 100 tons. Many small jobs of 20 tons or more have been placed. A school job in Worcester and a hospital in Southbridge, Mass., are pending.

Philadelphia—Eastern shape mills operate 50 to 75 per cent, averaging 65 per cent. Large consumers generally have closed on considerable pending shape tonnage at old prices and are not now in the market. On the other hand, many orders have been booked from smaller consumers at the new price, 1.70c, base, nearest eastern mill, on plain standard shapes. Sufficient time has not elapsed to determine the extent to which this higher level has become effective.

Pittsburgh—Shape awards continue quiet in this district. Specifications for plain material are fairly well maintained, but backlogs of fabricators are declining. Inquiry is light, but a fair volume is involved in projected work. Plain shapes are 1.60c, Pittsburgh.

Cleveland—Awards in structural shapes are at low ebb. Pending inquiries have largely been placed so that nothing worth while is up for bids locally. Plenty of work is on architects' boards, however. In some quarters it is expected this work may be rushed so that advantage may be taken of present low prices. Most fabricators are taking a firmer stand on bids for material fabricated and erected. Plain material is 1.60c, Pittsburgh.

Chicago—From 16,000 to 18,000 tons of structural steel is before the market, including 9000 tons for a bridge at Evansville, Ind. A fair amount of small-lot inquiry is out in the Chicago district. Pending work includes 2500 tons for Steinmetz senior high school, the low bid for structural steel being $59 a ton. The plain material price is unchanged at 1.70c, base, Chicago. Estimates are that 200,000 to 250,000 tons will constitute structural needs for eventual subway and surface transportation line extensions in Chicago. Engineering work has been completed but awaits final approval. Work may not proceed for at least six months.

Birmingham, Ala.—Backlogs and a few new contracts, mostly small lots, warrant steady operation at structural fabricating shops. Virginia Bridge & Iron Co. obtained contracts for two highway bridges in Kentucky, 2000 tons.

Contracts Placed

5000 tons, refinery unit, International Nickel Co. of Canada, Copper Cliff, Ont., to Dominion Bridge Co. Ltd., Montreal, Que.

3500 tons, state office building, Columbus, O., to McClintic-Marshall Co., Pittsburgh.

2000 tons, two state bridges in Kentucky, to Virginia Bridge & Iron Co., Birmingham, Ala.

1800 tons, State building, First street, Los Angeles, to Consolidated Steel Corp., Los Angeles.

Awards Compared

	Tons
Awards this week	**26,483**
Awards last week	**14,387**
Awards two weeks ago	**35,492**
Awards this week in 1929	**22,315**
Av. weekly awards, 1930	**35,313**
Av. weekly awards, 1929	**42,213**
Av. weekly awards, Sept.	**39,163**
Tot. awards to date, 1929	**1,703,721**
Tot. awards to date, 1930	**1,447,828**

1250 tons, addition to Senn high school Chicago, to Eggers-Schillo Co., Chicago.

1125 tons, gates and intake equipment, Safe Harbor Water Power Corp., Safe Harbor, Pa., to M. H. Treadwell Co.; Arundel Corp., general contractor.

1100 tons, 18-story penthouse apartment, Seventh avenue, northeast corner West Sixteenth street, New York, to Levering & Garrigues Co., New York; Henry Mandel interests, builders; Farrar & Watmough, architects.

1000 tons, plant at Hamilton, Ont., for Canada Iron Foundries Ltd., Montreal, Que., to Hamilton Bridge Co. Ltd., Hamilton.

700 tons, building, General hospital, Philadelphia, to Bear Engineering Co., Philadelphia.

700 tons, bridge at Coplay, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

600 tons, 18-story apartment, Seventh avenue, northwest corner of West Sixteenth street, New York, to Levering & Garrigues Co., New York, Henry Mandel interests, builders, Farrar & Watmough, architects.

570 tons, Connelly avenue bridge, Jersey City, N. J., to unstated fabricator; Park & Graham, contractors.

530 tons, bridge, Stanley, Va., Norfolk & Western railroad, to Virginia Bridge & Iron Co., Roanoke, Va.

500 tons, boiler house foundations, Brooklyn, N. Y., to Levering & Garrigues Co., New York.

410 tons, subway, route 101 section 3, Worth street connection, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Hart and Early Inc., general contractor.

400 tons, addition, Newport Chemical Co., Milwaukee, to Wisconsin Bridge & Iron Co., Milwaukee.

385 tons, catholic school, Union City, N. J., to Schaeffer Iron Works, Newark, N. J.

300 tons, court house, Pottsville, Pa., to Bethlehem Construction Co., Bethlehem, Pa.

300 tons, building, Home Savings bank, Milwaukee, to Worden-Allen Co., Milwaukee.

300 tons, union station, Oklahoma City, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City.

250 tons, Vanderbilt residence, 60 East Ninety-third street, New York, to George A. Just Co., Long Island City, N. Y.; George A. Fuller Co., general contractor.

250 tons, administration building, Long Island State Park commission, Babylon, Long Island, N. Y., to National Bridge Works, Long Island City, N. Y.; Robert J. Murphy Co., general contractor.

250 tons, garage, Yuengling Co., Pottsville, Pa., to Lehigh Structural Steel Co., Allentown, Pa.

250 tons, office building, Westchester Lighting Co., White Plains, N. Y., to Just Structural Engineering Co., White Plains.

250 tons, building, Wheeling Corrugating Co., Philadelphia, to Belmont Iron Works, Philadelphia.

230 tons, girder spans in Missouri for Chicago, Milwaukee, St. Paul & Pacific railroad, to American Bridge Co.

216 tons, theater, Ocean avenue, San Francisco, to Golden Gate Iron Works, San Francisco.

215 tons, alterations at Manhattan and Brooklyn plazas, vehicular roadway, westerly upper deck, Manhattan bridge, New York, to Bethlehem Steel Co., Bethlehem, Pa.; E. O. Roberts Co. Inc., general contractors.

214 tons, dormitory buildings, Hillsdale hospital, New Jersey, to Newton K. Bugbee, Trenton, N. J.; A. A. LaFoun-

tain, Hackensack, N. J., general contractor.

200 tons, building at Clay Center, O., for Kelley Island Lime & Transport Co., Cleveland, to Republic Structural Iron Works, Cleveland.

200 tons, jail, Mineola, N. Y., to National Bridge Works, Long Island City, N. Y.; John D. Cosgrove Inc., Glen Cove, N. Y., general contractor.

200 tons, replacing pipe fabricating shop and foundry, the Crane Co., Birmingham, Ala., to Southern Steel Works Co., Birmingham.

190 tons, bridge, Beaver Lake, N. J., Erie railroad, to American Bridge Co., Pittsburgh.

185 tons, biological laboratory, Harvard university, Cambridge. Mass., to Eastern Bridge & Structural Co., Worcester, Mass.

165 tons, bridge, Sussex junction, New York, Lehigh & New England railroad, to Bethlehem Steel Co., Betnlehem, Pa.

150 tons, auditorium, St. James church, Ferndale, Mich., to Whitehead & Kales Co., Detroit.

140 tons, armory building, Decatur, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

108 tons, dormitory, Harvard university, Cambridge, Mass., to Eastern Bridge & Structural Co., Worcester, Mass.

100 tons, hospital, Southboro, Mass., to Palmer Steel Co., Springfield, Mass.

100 tons, shop addition, Continental Tool Works, Braden avenue, Detroit, to the Austin Co., Detroit.

100 tons, building, Singer Sewing Machine Co., New Orleans, to Southern Steel Works Co., Birmingham, Ala.

100 tons, apartment, Pacific street, San Francisco, to McClintic-Marshall Co., San Francisco.

100 tons or more, shapes and bars, Port Covington grain elevator, Western Maryland railroad, Baltimore, to Maryland Steel Products Co. and Dietrich Bros., Baltimore; M. A. Long Co., Baltimore, engineer and constructor.

100 tons, Brunswick hospital, Amityville, Long Island, N. Y., to August Bellon, Rockaway Beach, N. Y.; John D. Cosgrove Inc., Glen Cove, N. Y., general contractor.

Contracts Pending

9000 tons, bridge over Ohio river at Evansville, Ind., for Indiana highway department.

3500 tons, Mills building, San Francisco; bids Oct. 9.

2500 tons, subway, department of public works, Philadelphia; bids Oct. 15.

2500 tons, improvement, Pennsylvania avenue, Philadelphia; bids open Oct. 15.

2350 tons, bridge, Baltimore & Ohio railroad, Potomac river.

2000 tons, McCurdy hotel, Evansville, Ind.

2000 tons, ore-handling bridges for Inland Steel Co., Chicago.

2000 tons, repairs to second span of Narrows bridge, Burrard Inlet Tunnel & Bridge Co., Vancouver, B. C.

1500 tons, 150 x 550-foot transformer tank shop, General Electric Co., Pittsfield, Mass., plans announced by E. A. Wagner, general manager.

1300 tons, apartment, Eighth avenue and Twelfth street, New York, for Bing & Bing.

1200 tons, highway bridge over Mississippi river at Lansing, Iowa.

1000 tons, plant construction, Brooklyn Edison Co., Brooklyn, N. Y.

900 tons, store building, East Orange, N. J., for B. Altman & Co., New York.

750 tons, hotel and theater building at Davenport, Iowa.

750 tons, post office, Pawtucket, R. I.; bids close Oct. 28.

700 tons, R-K-O theater, Albany, N. Y., revised estimate, general contract bids in.

600 tons, highway bridge, Mahaska county, Iowa.

560 tons, Atlantic avenue bridge, Los Angeles, went reinforced concrete.

550 tons, state tobacco building, Baltimore.

500 tons, post office, Lewistown, Mont.; bids close Oct. 31.

450 tons, government building, Mexico City, Mexico.

104 tons, laundry building, Salem, Mass.

Unstated tonnage, electrical group of buildings for Chicago Century of Progress exposition, Grant park, Chicago.

Concrete Bars

Small Orders Active—850-ton Laboratory Tops List—New Jersey Bridge, 500 Tons, Let—Highway and Bridge Requirements Active In Chicago and New York

REINFORCING BAR PRICES, PAGE 85

New York—Mills are now quoting concrete reinforcing bars on a basis of 1.70c, base, Pittsburgh, equivalent to about 2.15c, New York delivered, on large tonnages, cut lengths. New Jersey highways and subways lead in inquiry, close to 3000 tons pending. Small lot shipments are fairly active. New inquiry for industrial building, however, is lower. A Brooklyn warehouse will take 200 tons. About 4500 tons recently reported awarded to Jones & Laughlin Steel Corp. for the Lehigh Valley warehouse was booked through the National Bridge Works, Starret Bros. & Eken Inc., placing the business as reported in the Sept. 25 issue of STEEL.

Boston—In excess of 1100 tons of concrete bars was awarded, including 850 tons for a laboratory at Cambridge, Mass. Prices remain weak. A New England medical center for Boston will take 160 tons.

Pittsburgh—Concrete bar tonnage continues light and smaller than a month ago. Prices remain 1.90c to 2.00c for cut lengths and 1.65c to 1.75c for stock lengths. A fair tonnage is pending, but awards are few.

Buffalo — Buffalo producers of reinforcing bars have taken contracts for three lots ranging from 100 to 200 tons each. Few large inquiries are in sight. Prices continue sharply competitive. Mill operations represent only a fraction of capacity.

Cleveland—Concrete bars for the superstructure of the Civic stadium, approximately 1000 tons, will be awarded on Oct. 15 or shortly thereafter. General contract has not been let as yet for the Higbee Co. department store, which will take 300 tons or more. A building on East Ninth street, here, for Reserve Lithograph & Printing Co. is being planned of heavy concrete construction to cost $150,000.

Chicago—Highway and bridge reinforcing bar shipments are in steady volume as this type of work is being rushed to completion. Irregular prices are being reported in building work particularly billet bars, recent bids disclosing 1.70c and lower. Inquiry is lighter than a month ago. Pending work includes 700 tons, Eddystone apartments, and 600 tons for International house, University of Chicago.

Birmingham, Ala.—Shipment of reinforcing bars continues fairly good both to dealers as well as on direct contracts coming to the mills. Producers in the Birmingham district are enjoying good patronage, and prospects are bright.

Awards Compared

	Tons
Awards this week	**4,193**
Awards last week	**11,422**
Awards two weeks ago	**13,179**
Awards this week in 1929	**3,592**
Av. weekly awards, 1929	**5,849**
Av. weekly awards, 1930	**6,958**
Average weekly awards Sept.	**7,104**
Total awards to date, 1929	**252,846**
Total awards to date, 1930	**285,279**

Contracts Placed

850 tons, biological laboratory, Harvard university, Cambridge, Mass., to Concrete Steel Co., New York.

500 tons, route 4 section 7, Passaic river bridge and approach, New Jersey, to Igoe Bros., Newark, N. J.; Maggi & Schoonover, general contractors.

400 tons, 6-story plant, West Fifty-fourth street, near Eleventh avenue, New York, to Jones & Laughlin Steel Corp., Pittsburgh; Industrial Engineering Co., general contractor.

302 tons, Atlantic avenue bridge, Los Angeles, to unstated interest.

300 tons, Connelly avenue bridge, Jersey

(*Concluded on Page* 93)

Strip

Some General Demand Helps in Absence of Automotive Buying —Prices Holding Fairly Well

STRIP PRICES, PAGE 85

Pittsburgh—Improved strip demand from miscellaneous consumers partially offsets poor requirements of the automotive industry. Incoming tonnage remains moderately heavier than a month ago despite a decline in requirements of motorcar builders. The latter situation prevents strip producers from anticipating any marked improvement during the remainder of fourth quarter. Mill operations continue 40 to 50 per cent with cold strip output around 35 per cent. Prices hold at 1.60c to 1.65c for wide hot strip and 1.70c to 1.75c for narrow material. Cold rolled strip is 2.35c to 2.45c.

New York—Continued inactivity is imparting weakness to strip, although 1.65c and 1.75c, Pittsburgh appear the usual figures, respectively, on wide and narrow. Cold rolled strip is unchanged at 2.35c, Pittsburgh.

Philadelphia—Hot strip is easy and usually quoted 1.70c, Pittsburgh, for widths from 6 to 24 inches and 1.60c up to 6 inches. The usual price for hot strip above 24 inches is 1.80c, Pittsburgh, for heavy gages, and 1.95c for light, plus blue annealed extra. These figures are shaded on attractive business. Cold strip is firm at 2.35c, Pittsburgh.

Youngstown, O.—Demand for hot and cold-rolled strip continues to keep mills busy here at an average of about 55 per cent. Sharon Steel Hoop Co. has agreed to finish the pressing orders on the books of the Blair Strip Steel Co., New Castle, Pa., whose works were badly damaged several days ago by fire. Electric-welded tube mills are furnishing considerable business to hot-rolled mills in this district, while a miscellaneous line of consumers continues to furnish a fairly steady demand for the narrower sizes. Quotations generally are unchanged.

Cleveland—Tonnages of hot strip are somewhat larger. Most cold strip orders are small. The automotive industry is fairly well represented in buying, although not to the extent expected for this period. A local body plant is consuming material on a larger scale as its stamping operations increase in getting various parts assemblies ready for the new model Chevrolet to come out by Nov. 15. Hot strip is 1.60c and 1.70c, base, Pittsburgh, for wide and narrow, respectively. Cold-rolled is 2.35c, Cleveland, although in some cases 2.45c can be obtained. Practically all customers who contract are now under cover for the quarter.

Warehouse Sales Hold or Gain as October Opens

Warehouse Prices, Page 107

New York—Jobbing demand is picking up slowly. Some warehouse interests place gain in September business at 5 per cent over August, with this improvement a little more than sustained so far this month. Though subject to shading, prices generally are steady.

Boston—Continuation of small jobs has maintained a very satisfactory business for the various warehouse interests. These projects command the listed prices.

Buffalo—Warehouses report there has been an improvement in sales during the past ten days. Prospects for fourth-quarter sales are considerably brighter than had been anticipated.

Pittsburgh—Sales continue slow at a slightly better rate than a month ago. Building requirements still are light. Prices are unchanged and fairly steady.

Philadelphia—Jobbers report little if any change in October bookings as compared with September. Prices are unchanged except in reinforcing bars.

Cleveland—Local warehouse interests continue to report relatively light but steady buying, with occasional slight increase in some lines. September sales were about on a par with the preceding month, such deviations as occurred practically balancing one another. Little change is predicted for this month. Prices are unchanged and firm.

Cincinnati—Warehouse order books fail to reveal so far the expected upturn for October. Number of orders is fairly well maintained but tonnage is light. Prices remain unchanged.

Detroit—Jobbing business is showing improvement thus far in October over last month, but increases are due to other influences than takings from the automotive industries.

St. Louis.—Current routine demand and gradual reduction of consumer stocks were named as the chief factors in improvement of September business over August or July. Two leading interests reported September incoming business about equal to that of the same month last year. In one instance the favorable showing was due to considerable sales of materials for a public utility project in Missouri.

Operations by Districts Without Major Change

Pittsburgh—Ingot production is unchanged at 55 per cent. Sheet output continues at 50, but tin plate is lower at 60 to 65. Strip mills remain at 40 to 50, with pipe steady at 50 to 60.

Philadelphia—Eastern ingot production ranges from 58 to 80 per cent capacity, general average closer to 60 per cent. Shape output is at 65 and plates at 55 per cent of capacity.

Buffalo—Operations of district steelworks show a 2 per cent drop this week, to 51 per cent of total open-hearth capacity. All mills are on single turn. Lack of major rail tonnage on the books is responsible in large measure for the reduced ingot production.

Youngstown, O.—Steel plant operations show a further slight loss for the week at 53 per cent capacity, compared to 54 last week. Twenty-seven of 51 independent open hearths are on. Schedules of sheet makers are irregular, average being 45 per cent of capacity. Sharon Steel Hoop Co.'s works resumed while Falcon works of Empire Steel Corp. will be idle.

Cleveland—The 50 per cent ingot production rate of most of September continues in October, with each of the individual producers unchanged and 17 of the district's 34 open hearths pouring for the week.

Chicago—Steelworks operations as measured by open-hearth production remain unchanged at 55 to 57 per cent, although blast furnace output is off slightly. Illinois Steel Co. has only ten of its 27 steelworks blast furnaces in blast, against 11 the last week in September.

Birmingham, Ala.—Steelmaking operations continue at 48 to 50 per cent, with eight open-hearth furnaces on.

Union Steel Castings Co., Pittsburgh, has been awarded the contract for 844,610 pounds of steel castings for the army engineer, Pittsburgh. Bids were opened Aug. 25 and the successful bid was $39,274.36.

Concrete Awards

(*Concluded from Page* 89)

City, N. J., to Igoe Bros., Newark, N. J.; Parker & Graham, general contractors.

225 tons, waterworks system for Clinton, Okla., to J. B. Klein Iron & Foundry Co., Oklahoma City, Okla.

200 tons, warehouse in Memphis, Tenn., to Connors Steel Co., Birmingham, Ala.

200 tons, Illinois road work to Inland Steel Co., Chicago.

200 tons, school building, Niagara Falls, N. Y., to a Buffalo fabricator.

172 tons, storm drains, Los Angeles, to Soule Steel Co., Los Angeles.

134 tons, two bridges over Crandell slough, Oakland, Calif., to unstated interest.

110 tons, jail, Mineola, N. Y., to National Bridge Works, Long Island City, N. Y.; John D. Cosgrove Inc., Glen Cove, N. Y., general contractor.

100 tons, postoffice, White Plains, N. Y., to Joseph T. Ryerson & Son Inc., New York.

100 tons, power house, New York state, to a Buffalo fabricator.

100 tons, grade crossing, New York state, to a Buffalo fabricator.

100 tons, work including 57 tons for dormitory, Hillsdale hospital, New Jersey, to Kalman Steel Co., New York; A. A. LaFountain, Hackensack, N. J., general contractor.

100 tons, work including 50 tons, Brunswick hospital, Amityville, Long Island, N. Y., to August Bellon, Rockaway Beach, N. Y.; John D. Cosgrove Inc., Glen Cover, N. Y., general contractor.

100 tons, telephone building, East Orange, N. J., to Joseph T. Ryerson & Son Inc., New York.

Contracts Pending

1000 tons, superstructure, Cleveland civic stadium; bids close Oct. 15.

700 tons, Eddystone apartments, Chicago.

600 tons, International house, University of Chicago, Holabird & Root, 333 North Michigan avenue, Chicago, architects.

300 tons, Walker street viaduct, Oklahoma City Union Station Co., Oklahoma City, Okla.

300 tons, Higbee Co. department store, Cleveland; general contract about to be let.

200 tons, bank and store building, Davenport, Iowa; A. S. Graven Inc., 100 North LaSalle street, Chicago, engineer.

160 tons, New England medical center, Boston.

150 tons, bridge, Westchester county park commission, New York.

100 tons or more 3-story building Reserve Lithograph & Printing Co., East Ninth street, Cleveland; plans being made.

Stresses Teaching Power of Business Depression

New York—The annual trade survey submitted at the meeting of the National Association of Manufacturers, at the Roosevelt hotel, Oct. 6, while reflecting the business depression, revealed significant facts to indicate that the worst has been passed.

The survey, made by means of a questionnaire sent to members of the association, showed for iron and steel that while 52 per cent reporting considered present business poor and 36 per cent considered it fair, prospects for winter business were thought to be fair by 55 per cent and poor by 24 per cent. All agreed that there was no shortage of labor, and no strikes were reported.

John E. Edgerton, president of the association, voiced the opinion in addressing the group that "the use which the common intelligence makes of the depression with which we have just been at grips, will determine the birthday of its successor, and both its character and extent. Our concern now is not so much what we have learned of but from the depression."

George Westinghouse Memorial Is Dedicated

Industrial leaders joined with employes of the Westinghouse industries at Pittsburgh, Oct. 6, in honoring the memory of George Westinghouse, inventor and founder of a great industrial enterprise. The occasion was the unveiling of the Westinghouse memorial in Schenley park. More than 50,000 Westinghouse workers contributed to the cost of the memorial. E. M. Herr, vice chairman of the Westinghouse Electric & Mfg. Co., presided as chairman at the unveiling, while A. L. Humphrey, president of the Westinghouse Air Brake Co., made an address.

Among those in attendance at the ceremonies were Gerard Swope, president, General Electric Co.; Samuel Vauclain, chairman, Baldwin Locomotive Works; Otto H. Falk, president, Allis-Chalmers Mfg. Co.; George H. Houston, president, Baldwin Locomotive Works; George M. Verity, president, American Rolling Mill Co.; George H. Clifford, president, Stone & Webster Inc. and a number of railroad and public utility officials.

Will Survey Iron Alloys

New York—Over 60 industrial and scientific organizations under the leadership of the Engineering Foundation will participate in a world survey of the iron alloy field. The sum of $230,000 already has been subscribed. The survey will have the active assistance of the American Iron and Steel institute and the American Institute of Mining and Metallurgical engineers.

Pipe

East Inactive—Long Beach, Calif., Buys 2216 Tons, Milwaukee Bought 1000 Tons

PIPE PRICES, PAGE 107

New York—Cast pipe buying and inquiry is light, confined to small tonnages. Prices, however, hold firm at $36 to $37, eastern foundry, Southern foundry pipe also is firmly held since so little reaches this market because of freight differentials. Some foundries do not operate heavier than 60 per cent. Utility inquiry is not expected much before five weeks. New York city yard stocks continue to be lowered due to heavy laying contracts.

Boston—Action on two of the largest cast pipe tonnages to come out in some time may be deferred until spring, i.e., 7000 tons for Worcester, Mass., and 5000 to 6000 tons for Portland, Me. Private business continues in good volume. Prices are firm at $36 to $37.

Pittsburgh—New line pipe awards are lacking. Quietness continues in standard pipe and oil country goods. Producers look for additional line pipe projects to materialize next year. Pipe for oil and gas drilling purposes is in slow demand and standard pipe orders are restricted by quietness of building operations. Pipe mill operations continue 50 to 60 per cent.

Cleveland—Jobbers are continuing to place pipe orders as they need stock replacements—usually a carload at a time. A Mahoning valley mill will furnish the conduit for the building at East Ninth and Chester for the Acme Realty Co. The tubular goods for the Cleveland Clinic and the civic stadium have yet to be placed.

Birmingham, Ala.—Drouth in various sections of the country has had little effect on the cast pipe trade. Lettings are less active but production is being maintained. Shipments also are steady. American Cast Iron Pipe Co. is celebrating its twenty-fifth anniversary.

Chicago—Contract work in cast water and gas pipe has dropped off, largely due to the approaching end of the active laying season. Chicago board of local improvements will purchase about 300 tons of 6 and

TENNESSEE SPECIAL TOOL STEEL

"TENNESSEE Special" is a highly efficient carbon tool steel recommended for all purposes not requiring a high speed steel. Its absolute uniformity results in finished products that are superior. Its durability prolongs tool life and means more work per tool. All sizes are in stock ... *May we send you our stock sheets?*

FLATS, ROUNDS, SQUARES, OCTAGONS, HEXAGONS, CRUCIFORMS, ROUND CORNER FLATS, CHANNELER BAR SECTIONS AND QUARTER OCTAGONS FOR DRILLS, TAPS, REAMERS, DIES, SHEAR BLADES, PUNCHES, CHISELS, CALKING TOOLS, BEADING TOOLS, ETC. ▽ ▽ ▽ ▽

Tennessee Coal, Iron & Railroad Company

General Offices: Brown-Marx Building, BIRMINGHAM, ALA.

SUBSIDIARY OF

UNITED STATES STEEL CORPORATION

8-inch pipe in the next few days through a contractor. Chicago delivered prices are unchanged at $45.20 to $46.20. East Youngstown, O., purchased 500 tons of cast miscellaneous pipe and fittings for a filtration plant. Milwaukee awarded 1000 tons of 16-inch.

Contracts Placed

2216 tons, 4 to 12-inch class B cast pipe for Long Beach, Calif., to United States Pipe & Foundry Co., East Burlington, N. J.

1000 tons, 16-inch plain cast pipe for Milwaukee, to Glamorgan Pipe & Foundry Co., Lynchburg, Va., at $44.40 per ton, less 2 per cent for cash. Bid was $1.90 per ton higher than on a similar letting last December.

500 tons, miscellaneous cast pipe and fittings for East Youngstown, O., filtration plant, to Clammer & Noah, Akron, O., and Roberts Filter Mfg. Co., Darby, Pa.

137 tons, 6 and 10-inch cast pipe for Massachusetts, to R. D. Wood & Co., Florence, N. J.

Contracts Pending

7000 tons, 36-inch cast pipe for Worcester, Mass.; award may be delayed until spring.

5000 tons, 24-inch cast pipe for Portland, Me.; award may be delayed until spring.

331 tons, 6 to 12-inch class 150 cast pipe for Fullerton, Calif.; bids Oct. 7.

300 tons, 6-inch cast pipe for Hopkinton, Mass.; bids opened Oct. 4.

300 tons, 6 and 8-inch cast pipe for Chicago board of local improvements.

Year's Iron Ore Shipments Lowest in Six Years

Iron Ore Prices, Page 96

Cleveland—With the shipments of Lake Superior iron ore by vessel drawing to a close the tonnage moved so far this year indicates a total of 49,000,000 tons for the season, compared with 66,163,637 in 1929. This will be the lowest since 1924. The movement in September amounted to 6,488,088 tons, a decrease of 3,058,952 tons, or 32 per cent from that of the month last year. To Oct. 1 this season 39,064,009 tons has been shipped by vessel, a drop of 14,200,818 tons, or 27 per cent, from that in the comparable period last year. The Lake Superior Iron Ore association's report of shipments from upper lake ports to Oct. 1 follows:

	To Oct. 1 1929	To Oct. 1 1930
Escanaba	4,954,163	3,510,530
Marquette	3,556,660	2,442,737
Ashland	6,358,813	4,238,547
Superior	15,808,197	11,769,172
Duluth	17,050,529	11,756,115
Two Harbors	5,536,465	5,348,908
Total	53,264,827	39,064,009
1930 decrease		14,200,818

Wire

Jobber Buying Expected to Aid Activity in West—Some Low Nail Prices Are Being Met

WIRE PRICES, PAGE 85

Chicago—Western wire mills expect heavier jobber buying this month to take care of dealers whose stocks in agricultural areas have been reduced materially in the last 30 days. A corresponding decline in dealer sales would not be surprising as it appears autumn farm needs largely have been met. Western mills are quoting $2.05, Chicago or western mills, for wire nails, although it is reported $2 has been quoted here. Mills meet lower prices. Proposed advances in polished and galvanized staples and barbed wire are not being held. It is not expected that manufacturers' wire orders will improve present demand for the remainder of the year.

Worcester, Mass. — Vacillating prices and steady production is the story of the wire market. Little business beyond replacements is evident and most orders are for immediate shipment and use. Prices are firm at 2.40c, base, Worcester, for plain bright wire to dealers.

New York—Dullness continues in nails, which are $1.95 to $2, Pittsburgh. Concessions under this spread are highly exceptional. Bright wire is moving in fair quantity at 2.30c, Pittsburgh.

Pittsburgh—Wire consumers are showing improved interest in future requirements. Specifications continue slightly ahead of the rate a month ago despite continued quiet in manufacturer's wire, particularly in automotive tonnage. Demand from agricultural districts also is slow to expand. The market remains fairly steady with wire nails $2 and plain wire 2.30c. Old differentials on staples and barbed wire continue, producers generally not having followed an attempt to introduce higher differentials over the nail price.

Cleveland—Without any great bulge in tonnage, wire and wire products continue to improve slightly. All contracts for fourth quarter have been written and releases are coming through in small quantities as material is needed. Automotive expansion is noted in a small degree directly in orders for wire, wire nails and indirectly in releases for wire, wire rods, etc., from makers of nuts, bolts, rivets, screws, etc. Makers of nails recently have encountered what practically was a price war. Levels descended to $1.90, Cleveland. Some makers insist that $2 is their minimum and in some cases they claim ability to get $2.15. Wire is 2.30c, Cleveland, to manufacturers.

Bolt, Nut Specifications Show Little Gain

Bolt, Nut, Rivet Prices, Page 85

Pittsburgh—Little change in specifications for bolts, nuts and rivets is noted from the restricted activity of the past two months. Demand has improved slightly in some directions since August, but orders remain small. Jobbers are adding to stocks only moderately. The market continues steady at 73 off for bolts and nuts and 2.75c, Pittsburgh, for large rivets. Operations hold around 40 per cent.

New York—Manufacturers of bolts and nuts report slightly better business, with railroads showing more interest than expected. There are no large purchases, however. September sales by eastern manufacturers showed an increase of 5 to 10 per cent over the preceding month. Prices are unchanged; operations are 50 per cent.

Philadelphia—Good bolt and nut specifications are being filed but demand for rivets is slow. Reduction of track spikes from 2.80c to 2.75c, base, mill, brought out considerable business, particularly from anthracite mines.

Cleveland—Nut and bolt releases are slightly larger from some users. As a rule buyers take only necessities. Some stove plants are busier and automotive use is expanding. Jobbers appear to have well stocked shelves. Rivet orders are scattered. Rivet plants are feeling in increased measure the present trend toward welding. Plant operations vary between 40 and 50 per cent.

Chicago—More inquiries are developing in nuts, bolts and rivets, and it apepars that October specifications will show an improvement over September. Little improvement is noted in implement and tractor specifications. Bolt and nut discounts are unchanged, while large structural rivets remain at 2.85c, Chicago. Producer operations are about 40 per cent.

August shipments of power pumps totaled 2476 units.

Raw Material Prices

Pig Iron

Per Gross Ton

FOUNDRY, NO. 2

Chicago, furnace	$17.50
Pittsburgh, district fur.	18.00
Pittsburgh, delivered	18.63 to 19.13
Valley, furnace	17.50
Cleveland fur., local del.	17.50
Philadelphia, delivered	19.26 to 19.76
Virginia, furnace	17.75
Granite City, Ill., fur.	18.00 to 18.50
Buffalo, fur., local del.	18.50
Buffalo, del. Boston	21.41 to 21.91
Buff., all-rail, Brooklyn	20.41 to 20.91
Buff., all-rail, Newark	18.78 to 19.28
Ala., Bir. fur., local del.	14.00
Alabama, del. Chicago	17.51 to 18.01
Alabama, del. St. Louis	17.42
Alabama, del. Cincinnati	15.69 to 16.69
Alabama, del. Cleveland	18.51
Ala., Phila., dock del.	16.75 to 17.25
Ala., Balt., dock del.	16.50 to 17.00
Alabama, New York dock	17.00
Ala., Boston dock del.	17.25
Tenn., Bir. base, local del.	14.00
Tennessee, del. Cin.	15.69 to 16.69
Montreal, delivered	23.50
Toronto, delivered	22.10

FOUNDRY, NO. 2X

Buffalo, fur., local del.	19.00
Buff., all-rail, Brooklyn	20.91 to 21.41
Buffalo, all-rail Newark	19.28 to 19.78
Buffalo, del. Boston	21.91 to 22.41
Virginia furnace	18.25
Eastern, del. Phila.	19.76 to 20.26

FOUNDRY, NO. 1X

Buffalo fur., local del.	20.00
Eastern, del Phila.	20.26 to 20.76

MALLEABLE

Chicago, furnace	17.50
Cleveland fur., local del.	17.50
Pittsburgh district fur.	18.50
Pittsburgh, delivered	19.13 to 19.63
Valley furnace	18.00
Buffalo fur., local del.	19.00
Eastern Penna., delivered	19.26 to 20.91
Granite City, Ill., fur.	18.00 to 18.50
Montreal, delivered	24.00
Toronto, delivered	22.60

BASIC

Pittsburgh dist. fur.	17.50
Pittsburgh, delivered	18.13 to 18.63
Eastern Penn., del.	17.50 to 18.00
Buffalo fur., local del.	18.00
Montreal, delivered	22.50
Valley furnace	17.00

BESSEMER

Valley furnace	18.00
Pittsburgh, delivered	19.76

LOW PHOS

Valley fur., standard	27.00
Philadelphia, standard	24.76 to 27.79
Furnace, copper-bearing	23.00 to 23.50

GRAY FORGE

Valley furnace	17.00
Pittsburgh district fur.	17.50
Pittsbugh, delivered	18.13 to 18.63

CHARCOAL

Lake Superior, del. Chicago	27.04

SILVERY

Jackson County, O., fur., in per cents 6—$21; 7—$21.50; 8—$22; 9—$22.50; 10—$23; 11—$24; 12—$25; 13—$27.

BESSEMER FERROSILICON

Jackson County, O., fur., in per cents 10—$25; 11—$26; 12—$27; 13—$29; 14—$31; 15—$33; 16—$35.

Coke

Prices Per Net Tons

Beehive Ovens

Connellsville furnace	$2.60
Connellsville foundry	3.50 to 4.85
New River foundry	6.00
Wise county foundry	4.25 to 5.00
Wise county furnace	3.50 to 4.25

By-Product Foundry

Newark, N. J., del.	$9.00 to 9.40
Chicago ovens	8.00
New England, del.	11.00
St. Louis, del.	9.00
Birmingham, ovens	5.00
Indianapolis, del.	8.25
Ashland, Ky., ovens, Connell. basis.	5.50
Portsmouth, O., ovens, Connell. basis	5.50
Buffalo ovens	8.00 to 8.50
Detroit, ovens	8.50
Philadelphia, del.	9.00

Iron Ore

LAKE SUPERIOR ORE

Gross Ton, 51½%, Lower Lake Ports

Old range bessemer	$4.80
Mesabi bessemer	4.65
Old range nonbessemer	4.65
Mesabi nonbessemer	4.50
High phosphorus	4.40

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 56-63%, contract	10.00
Copper-free low phos. 58-65%	nom.

FOREIGN ORE

Cents per units, alongside docks Atlantic ports

Foreign manganiferous ore, 45-55% iron, 6-10% manganese	11.00
North African low phosphorus	10.50
Swedish basic, 65%	9.50
Swedish low phos.	11.00
Spanish, North African basic, 50 to 60%	9.50
Newfoundland fdy., 55%	9.00
Tungsten, spot and future short ton unit, duty paid	$12.50
Chrome ore, 48% net ton c.i.f.	$21.50 to 22.50

Manganese Ore

Prices, not including duty, are cents per unit; cargo lots.

Caucasian, 52-55%	27 to 28 cents
Indian, 48-50%	27 to 28 cents
Brazilian, 46-48%	25 cents

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. Works

First Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Maryland	$43.00
Georgia, Alabama	40.00 to 47.00

Second Quality

Pennsylvania, Ohio, Illinois, Kentucky, Missouri, Marvland	35.00 to 38.00
Georgia, Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., East Chicago, Ind.	52.00
Birmingham, Ala.	50.00 to 51.00

MAGNESITE BRICK

Pet net ton

9 x 4½ x 2½	65.00

MAGNESITE

Dead burned grain, net ton, Chester, Pa., or Baltimore bases	40.00
Domes, Chewelah, Wash., base	22.00

CHROME BRICK

Net ton, Chester, Pa., and Baltimore base, 9 x 4½ x 2½	45.00

Semifinished Steel

Prices Per Gross Ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$31.00
Pittsburgh, bessemer	31.00
Youngstown	31.00
Cleveland	31.00
Philadelphia	36.30
Chicago	32.00
Forging, Chicago	37.00
Forging, Pittsburgh	36.00
Forgings, Philadelphia	41.30

SHEET BARS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00
Chicago	32.00

SLABS

Pittsburgh	$31.00
Youngstown	31.00
Cleveland	31.00

WIRE RODS

Pittsburgh, Cleveland	$36.00
Chicago	37.00

SKELP

All grades, Pittsburgh	1.65c to 1.70c

Ferroalloys

(In dollars, except Ferrochrome)

*Ferromanganese, 78-82%, tidewater, duty paid	$99.00
*Ferromanganese, del. Pittsburgh	103.79
Spiegeleisen, 19-21%, domestic fur. spot†	33.00
*Ferrosilicon, 50 per cent, freight all., c. l.	83.50
Do, less carload	88.50
Do, 75 per cent	13.00 to 15.00
Ferrochrome, 66-70 chromium, 4-6 carbon. cts. lb., con., del.	11.00
Do, for spot delivery	11.50
Ferrotungsten, stand., lb. cont.	1.10 to 1.15
Ferrovanadium, 30-40 per cent, per lb., contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers' plants, net ton	160.00
Do, one ton to c. l.	170.00
Ferrophosphorus, per ton, carload 17-19 per cent, Rockdale, Tenn., basis (18 per cent)	91.00
Ferrophosphorus, electrolytic per ton carload, 23-25% f.o.b. Anniston, Ala., 24%	122.50

†Carloads. Differentials apply to large quantities.

*To users of carloads to 500 tons annually. Differentials apply to users of larger quantities.

Fluorspar

85 and 5 per cent grade

Washed gravel Kentucky and Illinois mines, per net ton	$17.25
Washed gravel, import duty paid east, tide, gross ton	19.50

ACME

Hot and Cold Rolled Strip
Electro Galvanized Strip

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Long Length Coils
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BROOKLYN DETROIT MILWAUKEE SAN FRANCISCO

STEEL

Pig Iron

Demand Active in Mid-West from Many Takers—50,000-ton Sale Rumored at Buffalo

PIG IRON PRICES, PAGE 96

Pittsburgh—Pig iron continues dull. Melters refuse to anticipate needs, leaving demand at current low rate of consumption. Producers are shipping largely from stocks with all seven merchant stacks idle. Prices are not clearly defined, current quotations representing the maximums. Insufficient tonnage is moving to establish market on larger lots. Basic price is largely nominal.

Boston—While there was a slight pick up in buying of pig iron in the past week, it was accompanied by a generally easier price situation. Altogether some 5000 tons were sold, of which Mystic Iron Works had nearly 2200 tons, one lot being for 1000 tons. No. 2 plain and No. 2X, as well as No. 1X are available at $15.50, furnace, Buffalo, and all furnaces east of Buffalo have met this.

New York—Pig iron sales at about 10,000 tons are off from a week ago, with prices easier. Buffalo iron may be quoted at $15.50 to $16, base, with southern iron weak at $17, delivered New York docks. A leading purchase involves 3000 tons of foundry from the Thatcher Furnace Co., distributed equally between Buffalo, Eastern Pennsylvania and Southern furnaces. It was comprised mostly of No. 2 plain, with a small portion of No. 2X. Inquiry totals possibly 6000 tons, of which a substantial portion is for shipment outside the district. Included is inquiry for 1000 tons of foundry for shipment outside and 1000 tons of malleable for a New England consumer. A price of $23, delivered, has been rejected by a Connecticut consumer of copper free low phosphorus iron, in the market for 1000 tons. The Adrian furnace is scheduled to be blown out Oct. 15. Operations at the Port Henry, N. Y., furnace will not be resumed this month, as was recently reported likely.

Buffalo—Operations and prices are unchanged. Purchase of 50,000 tons of pig iron by Roger Brown & Crocker Bros. Inc. from the Wickwire Spencer Steel Co. is reliably reported. This tonnage is for distribution in the Middle West.

Philadelphia—Foundry iron purchasing has increased and the past week's business includes a larger than usual total, but made up as usual of small tonnages for quick shipment. Sales of basic were nearly 20,000 tons during the past three or four weeks. More business of this grade is in sight. Eastern Pennsylvania foundry continues $18.50 to $19, base furnace, subject to equalizing, and basis of $17.50 to $18, delivered in this territory. English low phos iron has been offered at $23.50 to $24, duty paid tidewater.

Shipment of 1000 tons of foreign free low phosphorus iron is expected to arrive here this week.

Cleveland—Fresh inquiry of size is lacking and the pig iron market is seasonally slow to improve. Small lots dominate. The rate of shipments, higher in September than August, has fallen off thus far in October. The month, however, should mark a gain over September with increased activity among radiator and furnace manufacturers already apparent. Likewise, melters selling in the Michigan districts see renewed demand for engine blocks from auto makers working on next year models. Prices are unchanged with $17.50, local delivery, the current quotation by Cleveland furnaces. Lake furnace prices are the same. The lower Michigan interest had one of the largest week's sales in some time and reports better diversification from all lines. The sales aggregate for furnaces with headquarters in Cleveland was high at 19,600 tons for the week.

Chicago—Pig iron sales are maintaining the recently improved volume, October shipments gaining over September. Reduced Valley price is apparently not affecting the local furnace market of $17.50 for base grades. A small amount of resale iron was offered in the Milwaukee district under $17. Brokers find it difficult to buy in the market to cover short orders. Buyers bargain for lower prices but furnace interests hold more firmly than a month ago. A western auto builder closed on several thousand tons. About 100 tons of foundry iron is on inquiry from a local melter. Nearly 1000 tons of Southern iron was sold in this district at $12 for higher silicon grades. Price of $11.50, Alabama furnace, is not applying on sales here as little base grade is used, but extras for silicon are being dropped.

Further inquiries and feelers are being put out for iron in first quarter of 1931.

Cincinnati—Sales of pig iron in this district exceeded 4000 tons during the past week, including a 500-ton order of Northern iron to an Eastern Ohio melter, and a 300-ton order of southern iron to an Indiana consumer.

St. Louis—Entrance into the fourth quarter has brought no noticeable change in the pig iron situation in this district. Buying is mainly of small lots for prompt shipment, and prices remain quotably unchanged.

Birmingham, Ala.—Orders are reported from the Middle West, Ohio, Indiana and Illinois, with a few scattering contracts from the East. Local demand is unchanged, small lot orders being placed frequently with specification for early delivery. Evidence is being taken here by a special commissioner for interstate commerce commission on low freight rates to the East. Base price holds firmly at $14, No. 2 foundry, with concessions on outside shipments.

Toronto, Ont.—Total sales during the past week are only about 20 per cent of the total booked in the corresponding season last year. Spot buying is showing some improvement, new orders running from 50 to 200 tons. It is reported from Hamilton, Ont., that the Steel Co. of Canada Ltd., has blown out one of its stacks, while from Sault Ste. Marie, Ont., comes word that the Algoma Steel Corp. will blow in a second furnace within a few days. Pig iron prices are unchanged.

Ferromanganese Orders Are Slow at September's Rate

Ferroalloy Prices, Page 96

Chicago—Specifications for ferromanganese and 50 per cent silicon are at the September level. Orders for ferrochrome from gray iron foundries still are much reduced, although foundries now are pouring on an average of three to four days weekly. No recent sales of spiegeleisen have been reported and the market is nominal on the basis of $33, eastern furnace, for carload lots of 19 to 21 per cent metal.

Pittsburgh—Failure of steelmaking operations to expand continues to restrict activity in ferromanganese and spiegeleisen. Prices continue $103.79, delivered, for ferromanganese and $33, furnace, for spiegeleisen.

New York—Chrome and silicon alloys are holding the gain in shipments made in September. Nearly all specifications are for quick shipment. Prices of all special ferroalloys are unchanged. Slightly better activity is noted in both ferromanganese and spiegeleisen, although the situation is far from brisk. Prices on both are unchanged.

Scrap

Light Buying and Restricted Melt Weaken Prices—Some Releases Give Encouragement

Chicago—Dealer bookings of iron and steel scrap remain light. Collection of country scrap is almost negligible at the present market. Industrial and railroad releases also are small. Heavy melting steel is quoted at a top of $12.50, fresh tonnages having been sold at that figure. A producer of plumbing equipment is seeking 2 and 3-foot rail ends, but the prices offered have failed to attract dealers and brokers. Offers to sell cast borings at $7 have been turned down by melters. A number of cars of scrap have been moved back to dealers' yards at lower prices after rejections by several large melters.

New York—Scrap is weak, with slight downward revisions in No. 2 yard steel and skeleton steel, the latter reflecting a decline of 25 cents re-

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons delivered to consumers, except where otherwise stated.

HEAVY MELTING STEEL

Birmingham	10.50 to 12.00
Boston, dealers	8.50 to 8.75
Buffalo, No. 1	13.00 to 13.50
Buffalo, No. 2	11.00 to 11.50
Chicago	12.00 to 12.50
Cinci., deal.	11.00 to 11.50
Cleve., No. 1	11.75 to 12.00
Cleve., No. 2	11.00 to 11.50
Det., No. 1 deal.	11.25 to 11.75
Det., No. 2 deal.	9.50 to 10.00
E. Pa. del. mill	12.50 to 13.00
N. Y. del. R. R.	9.00 to 10.00
N. Y. deal. No. 2	6.25 to 6.50
N. Y., deal. yd.	6.00 to 6.50
Pitts. No. 1	14.50 to 15.00
St. L. No. 1 sel.	11.50 to 12.00
Federal, Ill.	11.75 to 12.25
Granite C., Ill.	10.00 to 10.25
Valleys, No. 1	15.00 to 15.50

COMPRESSED SHEETS

Buffalo, dealers	11.00 to 11.50
Chicago	10.25 to 10.75
Cleveland	11.25 to 11.50
Detroit, dealers	11.25 to 11.75
E. Pa. new mat.	11.50
Pittsburgh	14.50 to 15.00
Valleys	14.50 to 15.00

BUNDLED SHEETS

Buffalo	9.00 to 9.50
Cinci., deal.	9.50 to 10.00
Cleveland	9.00 to 9.25
Eastern Pa.	9.50 to 10.00
Pittsburgh	13.50 to 14.00
St. Louis	6.50 to 7.00

SHEET CLIPPINGS LOOSE

Chicago	7.50 to 8.00
Cincinnati	7.50 to 8.00
Detroit, dealers	8.00 to 8.50
St. Louis	6.50 to 7.00

STEEL RAILS SHORT

Birmingham	12.00 to 12.50
Boston, dealers	7.25 to 8.60
Buffalo	16.00 to 16.50
Chicago (3 ft.)	13.50 to 14.00
Chicago (2 ft.)	14.25 to 14.75
Cinci., deal.	16.00 to 16.50
Detroit, deal.	15.00 to 15.50
Pitts. (open-hearth, 3 ft. and less)	17.00 to 17.50
St. Louis	14.50 to 15.00

STOVE PLATE

Birmingham	9.00 to 10.00
Boston, con.	8.00 to 8.50
Buffalo	10.25 to 10.50
Chicago, net	9.50 to 10.00
Cinci., deal. net	5.75 to 6.25
Det., net, deal.	8.50 to 9.00
Eastern Pa.	10.00
N. Y., deal. mill	6.00
St. Louis	9.00 to 9.50

COUPLERS, SPRINGS

Buffalo	15.50 to 16.00
Chicago	13.50 to 14.00
Eastern Pa.	17.00 to 17.50
Pittsburgh	17.50 to 18.00
St. Louis	12.50 to 13.00

ANGLE BARS—STEEL

Chicago	13.00 to 13.50
St. Louis	12.00 to 12.50

LOW PHOSPHORUS

Buf., billets and bloom crops	16.50 to 17.00
Cleveland bil. and bloom crops	17.50
Eastern Pa.	17.50 to 18.00
Pitts. billet and bloom crops	19.50 to 20.50
Pitts. sheet bar crops	17.50 to 18.00

FROGS, SWITCHES

Chicago	13.00 to 13.50
St. Louis	12.75 to 13.25

SHOVELING STEEL

Chicago	12.00 to 12.50
Cleveland	8.00 to 8.50
St. Louis	11.25 to 11.50

RAILROAD WROUGHT

Birmingham	9.50 to 10.00
Boston, dealers	8.00 to 8.50
Buffalo, No. 1	10.00 to 10.50
Buffalo, No. 2	13.50 to 14.00
Chicago, No. 1	11.25 to 11.75
Chicago No. 2	12.00 to 12.50
Cinti., No. 2	11.00 to 11.50
Eastern Pa.	14.00 to 14.50
N. Y., No. 1 di.	10.00 to 10.50
Pitts. No. 2	14.50 to 15.00
St. Louis, No. 1	9.00 to 9.50
St. Louis, No. 2	11.00 to 11.50

SPECIFICATION PIPE

Boston	7.00 to 7.25
Eastern Pa.	12.00 to 12.50
N. Y., deal.	7.25 to 7.50

BUSHELING

Buffalo, No. 1	11.00 to 12.50
Chicago, No. 1	9.50 to 10.00
Cinn., No. 1 dl.	9.25 to 9.75
Cinn., No. 2	6.00 to 6.50
Cleve., No. 2	7.00 to 7.50
Detroit, No. 1 new deal.	9.25 to 9.75
St. L. No. 1	8.00 to 8.50
Val. new No. 1	13.75 to 14.25

MACHINE TURNINGS

Birmingham	7.50 to 8.50
Boston, dealers	3.85 to 4.25
Buffalo	8.00 to 8.50
Chicago	6.25 to 6.75
Cinn., deal.	6.25 to 6.75
Cleveland	6.50 to 7.00
Detroit	5.50 to 6.00
Eastern Pa.	9.00
N. Y., deal.	5.00 to 5.50
Pittsburgh	7.00 to 7.50
St. Louis	6.00 to 6.50
Valleys	10.50 to 11.00

BORINGS AND TURNINGS
For Blast Furnace Use

Boston, chem.	9.00 to 9.25
Buffalo	8.75 to 9.25
Cinn., deal.	6.50 to 7.00
Cleveland	7.50 to 8.00
Detroit, deal.	5.75 to 6.25
Eastern Pa.	7.00 to 8.50
N. Y., deal.	4.00
Pittsburgh	8.50 to 9.00

CAST IRON BORINGS

Birming., chem.	12.50 to 13.00
Birming., plain	7.50 to 8.50
Boston, chem.	9.00 to 9.50
Boston, deal.	3.85 to 4.25
Buffalo	8.75 to 9.25
Chicago	7.50 to 8.00
Cinn., deal.	6.50 to 7.00
Cleveland	7.50 to 8.00
Detroit, deal.	5.50 to 6.00
Eastern Pa.	8.50 to 9.00
E. Pa. chem.	14.00 to 14.50
N. Y., deal.	4.50
Pittsburgh	8.50 to 9.00
St. Louis	5.50 to 6.00

PIPE AND FLUES

Cinn., deal	8.00 to 8.50

RAILROAD GRATE BARS

Buffalo	9.25 to 9.75
Chicago, net	8.50 to 9.00
Cincinnati	7.00 to 7.50
Eastern Pa.	10.50
N. Y., deal.	6.50 to 7.00
St. Louis	10.00 to 10.25

FORGE FLASHINGS

Boston, deal.	6.50 to 7.50
Buffalo	11.00 to 11.50
Cleve. ov. 10 in.	10.00 to 10.50
Detroit	9.75 to 10.25

FORGE SCRAP

Boston, deal.	6.50 to 7.00
Chicago	14.50 to 15.00
Eastern Pa.	11.00 to 11.50

ARCH BARS, TRANSOMS

Chicago, net	13.00 to 13.50
St. Louis	13.00 to 13.50

AXLE TURNINGS

Boston, deal.	6.75 to 7.00
Buffalo	11.50 to 12.00
Chi. steelworks	9.50 to 10.00
Cleveland	11.00 to 11.50
Eastern Pa.	11.50 to 12.00
Pittsburgh	12.50 to 13.00
St. Louis	9.25 to 9.75

STEEL CAR AXLES

Birmingham	16.50 to 17.50
Bos., ship. pt.	16.50 to 17.00
Buffalo	16.00 to 16.50
Chicago	16.80 to 17.35
Eastern Pa.	21.00 to 22.00
St. Louis	16.00 to 16.50

SHAFTING

Bos., ship. pt.	13.00 to 14.00
Chicago	16.25 to 16.80
Eastern Pa.	18.50
N. Y., deal.	13.00 to 14.00
St. Louis	13.00 to 13.50

CAR WHEELS

Birming., iron	10.00 to 11.00
Boston, iron	14.00 to 14.50
Buffalo, iron	13.50 to 14.00
Buffalo, steel	15.00 to 15.50
Chicago, iron	13.50 to 14.00
Chi., roll steel	14.50 to 15.00
Cincinnati	12.00 to 12.50
Pitts., iron	15.00 to 15.50
Pitts., steel	17.50 to 18.00
St. Louis iron	11.75 to 12.25
St. Louis, steel	14.50 to 15.00
E. Pa. steel	16.75 to 17.00
E. Pa. iron	14.50 to 15.00

NO. 1 CAST SCRAP

Birming., cup.	11.00 to 11.50
Buffalo (mac.)	11.25 to 11.50
Boston, textile	11.00 to 11.50
Chicago, mach.	13.45 to 14.00
Chi., railroad	11.20 to 11.75
Chicago, agri.	10.90 to 11.50
Cinn., mach. cup., gross	14.50 to 15.50
Cleve. cupola	13.50 to 14.00
Det., net deal	8.75 to 9.25
E. Pa. cupola	13.50
N. Y. cup. deal.	9.50 to 9.75
N. Y., del. local foundries	14.00
Pitts. cupola	13.50 to 14.50
San Fran., del.	13.50 to 14.00
Seattle	14.00 to 14.25
St. L. No. 1 ma.	10.75 to 11.25
St. L. No. 1	10.00 to 10.50

HEAVY CAST

Boston	10.50 to 11.00
Bos. Mach. cast	12.50 to 13.50
Buffalo, break	8.50 to 9.00
Cleve., break	8.00 to 8.50
Detroit, auto, net deal.	11.00 to 11.50
Det., break., dl.	7.00 to 7.50
Eastern Pa.	11.50 to 12.50
N. Y. No. 1 dl.	8.00 to 8.50
N. Y. break. dl.	7.75 to 8.50
Pittsburgh	11.00 to 11.50

MALLEABLE

Boston R. R.	14.00 to 14.50
Buffalo	15.00 to 15.50
Chicago, agri.	11.75 to 12.25
Chicago, R. R.	13.50 to 14.00
Cinn., R. R. dl.	12.50 to 13.00
Cinn., agri., dl.	12.50 to 13.00
Cleve., rail	15.50 to 16.00
Det. auto deal.	13.50 to 14.00
St. Louis, rail	10.00 to 10.50

RAILS FOR ROLLING
5 feet and over

Birming. cup.	12.50 to 13.50
Boston	10.00 to 10.25
Buffalo	13.00 to 13.50
Chicago	14.50 to 15.00
Eastern Pa.	13.00 to 13.50
New York	9.50 to 10.00
St. Louis	13.50 to 14.00

LOCOMOTIVE TIRES

Chicago, cut	15.00 to 15.50
St. L. No. 1	13.00 to 13.50

LOW PHOS. PUNCHINGS

Chicago	13.00 to 13.50
Pittsburgh	17.00 to 17.50
Eastern Pa.	17.00 to 18.00
Buffalo	16.50 to 17.00

Superior CHARCOAL PIG IRON *always* BEHAVES THE SAME

EVERY PIG in a carload of Superior Charcoal Pig Iron is as reliable in physical structure as in chemical analysis. And every carload is accurately graded by fracture as well as by laboratory analysis. Made in small tonnages, under a slow, careful process and low blast temperatures, a uniform high quality unequalled by ordinary pig iron is assured.

Charcoal Iron castings are stronger, tougher, closer grained, and easier and less costly to machine. Troublesome shrinkage is eliminated; there are no checks, cracks, breaks and other defects usually caused by doubtful pig iron, and there is naturally a substantial reduction in failures and rejection troubles.

Specify Superior Charcoal Pig Iron to be used in your castings and note the improvement in quality and uniformity. Write for our Booklet "Superior Charcoal Pig Iron" for valuable casting information.

SUPERIOR CHARCOAL IRON CO.
GRAND RAPIDS · MICHIGAN
DEBEVOISE-ANDERSON COMPANY, INC., Eastern Representative
NEW YORK · · · BOSTON · · · PHILADELPHIA

cently at Harrisburg, Pa. An encouraging feature is resumption of shipments of No. 1 railroad steel for Claymont, Del., against contracts placed several months ago at higher prices than now prevail. A Bayonne, N. J., consumer of stove plate is again taking shipments, after a lapse of a fortnight or so. No melting steel is now being shipped out of this district to Pittsburgh, as far as can be learned.

Boston—The market for scrap continues uninteresting and prices are uncertain as American Steel & Wire Co. at Worcester has practically withdrawn from the market.

Philadelphia—Trading in steel and iron scrap is restricted to small and moderate tonnages. Prices show an easier tone but are untested.

Buffalo—Buffalo district prices are 25 to 50 cents lower in nominal quotations on active materials. Some steelworks are directing major restriction in shipments. Some sales of machine shop turnings have been made but at lower prices than last quoted. The market is inactive and unsteady.

Pittsburgh—Steel and iron scrap continue weak and quiet. Most mills still are out of the market and dealers with heavy melting steel orders to cover find tonnage more readily available, some being picked up around $14.50. This grade on the Pennsylvania list is understood to have brought up to $15.25. The market is quotably lower at $14.50 to $15. Machine shop turnings and blast furnace scrap are also easier. Compressed sheets are stronger on sales at $14.

Cleveland—A large consumer of iron and steel scrap has released shipments on heavy melting steel and continues to receive blast furnace scrap. However, movement of both is not in sufficient volume to have a buoyant effect. The second mill is still out of the market. No. 1 heavy melting steel has eased off slightly to $11.75 to $12. No. 2 steel continues $11 to $11.50. Blast furnace scrap is dull with cast iron borings and mixed borings and turnings quoted $7.50 to $8.

Cincinnati—Movement of iron and steel scrap is at a low rate with shipments to important consumers restricted. Light railroad scrap lists help maintain a fairly strong market in heavy melting steel, although demand is unimproved. Quotations are unchanged.

Detroit—Heavy melting steel scrap can still be considered at $11.25 to $11.75 in spite of reports of a reduction. The steel on a recent important automotive list brought $12. Rumors of weakness in stove plate appear to have been exaggerated, the current level being $8.50 to $9. The cast grades are moderately easier, No. 1 new machinery being $8.75 to $9.25, and new heavy auto $11 to $11.50, both net tons. Blast furnace grades of scrap are weaker, turnings, borings and mixed turnings and borings being marked down 25 cents.

St. Louis—Following a month or six weeks during which steel and iron scrap displayed considerable firmness and signs of improvement, an easier tone has developed and confidence has given place to uncertainty among sellers.

The unfavorable change is due to heavier offerings by railroads and failure of mills to make commitments. Business expected during the last half of September and early this month has failed to materialize, and consumers are not willing to expand their scrap holdings.

Birmingham, Ala.—Low prices and slow business rule, and the lull has been the longest extended and the most severe in the history of the industry. Heavy melting steel, which finds a little demand at all times, ranges from $10.50 to $12, delivered.

Toronto, Ont.—Some improvement in sales is reported in iron scrap, while steel grades are moving slowly. Hamilton mills are out of the market for turnings, but are taking small tonnage lots of No. 1 heavy melting steel. A stronger demand has developed lately for machinery cast and some good orders have been booked. Other iron grades are spotty. A general price revision was announced by dealers, with reductions of $2 to $5 per ton, in both the Toronto and Montreal districts.

Canadian Scrap

Dealers' Buying Prices

MONTREAL

Per Gross Ton

Iron axles	$11.00
Steel axles	10.00
Car wheels	8.00
Stove plate	8.00
Wrought pipe	2.00
Turnings	2.00
Heavy melting steel	6.00

TORONTO

Steel axles	7.00
Iron axles	7.00
Heavy melting steel	7.00
Turnings	2.00
No. 1 mach. cast (net)	9.00
Malleable (net)	7.00

Coke

Foundry Demand Gains in West —Cooler Weather Boosts Domestic Use—Prices Unchanged

COKE PRICES, PAGE 96

Pittsburgh—Most grades of beehive for industrial uses continue quiet. Furnace fuel demand, for blast furnaces is at a low level but requirements of gas producers are gaining slightly. Domestic grades' purchasing is slow to expand. Foundry coke lacks further improvement following a slight pickup recently. All prices are unchanged.

Beehive coke production in the Connellsville district in the week ended Sept. 27 was 18,420 tons, against 18,440 tons the preceding week and 76,970 tons a year ago, according to the *Connellsville Courier*.

Boston—With the coming of more seasonable weather demand for domestic coke shows a better trend and ovens are stepping up some. Oversupply taken by dealers prior to the price advance checked demand for the time being. Now this point seems to have been adjusted, so that shipments should improve.

Cincinnati—Only spotty improvement is noted in specifications for by-product foundry coke. Definite index to improved melt has not developed. Price remains at $9, delivered Cincinnati.

New York—With the advent of cooler weather, furnace coke is in better demand. Foundry coke continues unchanged, however, both in volume and price.

Chicago—By-product foundry coke shipments are estimated to be about 20 per cent over August. Oven capacity in the district is more than 75 per cent engaged. Prices remain at $8 ovens, and $8.75 for delivery in the Chicago switching district.

St. Louis—Further slight improvement in new orders and specifications is noted by producers and distributors of metallurgical coke. While no evidence of a desire to accumulate has appeared, melters are disposed to carry larger reserves. Since the middle of September the movement to western and southwestern melters has expanded, and all quotas due on contracts are being accepted as due. No change in prices has occurred.

Birmingham, Ala.—Production is being gaged by demand, with no change in output for the week.

Pacific Coast

Prospects Cover More Tonnage Than Actual Contracts—Much Improvement Work Pending in Northwest — California Totals Below Awards of 1929—Pipe Holds Up Well—Prices Steady

Seattle—While no tonnages exceeding 100 tons of iron or steel have been placed in the Pacific Northwest this week, important projects are pending. According to indications 14,000 tons of steel are to be awarded in and near Seattle during October. Of the total, plates show about 10,000 tons, structurals 2000 tons and concrete bars about 2000 tons.

Both mill and jobbing prices are steady and unchanged. Mill prices of reinforcing are 2.30c, merchant bars and shapes 2.25c and plates range from 2.15c up.

Bars, Plates and Shapes

Operations at local steel mills are unchanged. No large jobs have recently been closed. Demand for merchant bars is limited. Considerable work involving concrete bars is up for figures. General contracts have been awarded for the Textile Tower, 600 tons, and Edmond Meany hotel, 400 tons. Bids are asked for the Sixth avenue garage, 350 tons, and the Commercial Tire Co. building, also about 350 tons. A. W. Quist & Co. have the general contract for the first unit of St. Mary's hospital at Astoria, Oreg., calling for 35 tons of reinforcing material.

Seattle will receive bids Oct. 10 for the Beacon Hill and West Seattle pipelines, involving a total of approximately 8600 tons of plates for 48 and 66-inch riveted or lock bar water pipe. Spokane opens bids this week for 36-inch steel pipe, totaling about 700 tons, in addition to valves, bends, reducers and other accessories. The same project involves also either a steel or concrete water tank, capacity 1,250,000 gallons.

Bids were opened today for furnishing head gates for the Rock Island dam, calling for 1200 tons of structurals. The Fox theater, Spokane, 300 tons, Howard street bridge, Spokane, 200 tons, and Marine drive bridge, Seattle, 200 tons, are other structural jobs on which the subcontracts are pending.

Old Materials

Steel scrap is unchanged, prices quoted by local mills being $9.50 to $11, gross. Receipts exceed consumption and only the better grades are arriving. Most is railroad scrap. Cast iron continues weak at about $11, net.

Coast Pig Iron Prices

Utah basic	$22.00 to 24.00
Utah foundry	22.00 to 24.00
*German	24.25
*Indian	22.00 to 24.00

*C.i.f. duty paid.

Some Gains Are Made

San Francisco—(*By Air Mail*)—While demand for iron and steel products is far from active, improvement is noted and prices, with one or two exceptions, are holding to established levels. The largest award involved 2216 tons of cast iron pipe for Long Beach, and the most important pending project calls for 8000 tons of structural shapes for the Olympic club in San Francisco.

Bars, Plates and Shapes

Awards of concrete bars aggregated 3633 tons, the largest weekly total in two months. To date this year 52,934 tons have been placed, compared with 63,500 tons for the corresponding period last year. Among the larger lots placed were 172 tons for two storm drains in Los Angeles, booked by the Soule Steel Co., and 302 tons for the Atlantic avenue bridge in the same city, awarded to an unnamed company. Most new inquiries range from 40 to 60 tons. Mild steel bars continue to move in small lots while prices remain firm at 2.35c, c.i.f.

About 2000 tons of plates and sheets were involved in the contract placed with the Hollo Metal Door Trim Co. for the Los Angeles general hospital. The only other award of note calls for 260 tons for a 55,000-barrel tank for the naval operating base in San Diego, the general contract for which was placed with the R. E. Hazard Contracting Co. Prices are off $2 a ton and 2.15c, c.i.f. is now general with 2.05c applying on heavy tank and pipe line tonnages.

This week's total of structural awards was the heaviest in nearly two months and aggregated 2416 tons. To date 88,288 tons have been booked, compared with 143,687 tons for the same period in 1929. Among the lettings were 1800 tons for the new State building in Los Angeles, taken by the Consolidated Steel Corp. Other awards involved 216 tons for a theater on Ocean avenue, San Francisco, booked by the Golden Gate Iron Works. Bids will be opened Oct. 9 for 3500 tons for the new Mills building, San Francisco.

Other Finished Material

The United States Pipe & Foundry Co. took 2216 tons of cast iron pipe for Long Beach, Calif. Awards so far this year aggregate 63,083 tons, compared with 68,180 tons for the corresponding period in 1929. Awards are expected to be made within a few days on 3008 tons for Los Angeles and 2022 tons for the East bay municipal utility district in Oakland. The only new inquiry of size calls for 331 tons for Fullerton, Calif., bids on which will be opened Oct. 7.

F.o.b. Pittsburgh

(*Concluded from Page* 37)

month than for some time, due to the continued low level of prices and to the fact that stocks had been permitted to become well depleted in many cases.

Tin plate production has held to a pace that successfully contradicts most of the predictions made during early August regarding the effects of the drought on vegetable packs. The usual decline in tin plate demand now is being experienced, but the year as a whole can be called a good one.

The merchant pig iron industry has made little recovery from the low ebb of the year although the Pittsburgh and valley districts usually lag behind other territories in an upturn in activity. All of the seven merchant furnaces in the valleys and in Pittsburgh currently are idle.

Pipe mills still are poorly engaged on production of smaller sizes of tubular products but are busy on old orders for line pipe. The bulk of recent orders for the latter has gone to Youngstown district producers. Fabricators, freight car builders and barge yards are operating largely against old business, with new orders light. Steel mill equipment builders, however, report good activity in both operations and new business.

◆

With the formal acquisition of the Oil Well Supply Co. by the United States Steel Corp. on Sept. 29 the report continues that the latter is seeking control of the Dresser Mfg. Co., Bradford, Pa. The Dresser company manufactures pipe couplings and its purchase would help to round out the line of products which the Steel corporation through its subsidiary, the National Tube Co., now is able to offer to the oil and gas industry.

Steel, Wrought and Cast Iron Pipe, and Tubing

Welded Iron, Steel Pipe

Base Price $200 ton

Base Discounts on steel pipe, Pittsburgh and Lorain, O., to jobbers in carloads. Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del., 2 points less. Wrought iron pipe, Pittsburgh base.

BUTT WELD

Steel In.	Blk.	Gal.	Iron In.	Blk.	Gal
½	58	44½	½	23	5
¼	62	50½	¾	28	11
1—3	64	52½	1 and 1¼	31	15
			1½ and 2	35	18

LAP WELD

2	57	45½	2	23	9
2½—6	61	49½	2½—3½	28	13
7—8	58	45½	4—6	30	17
9—10	56	43½	7 and 8	29	16
11—12	55	42½	9—12	26	11

BUTT WELD

Extra strong, plain ends

½	55	44½	¼ & ⅜	+13 +48
¾	60	49½	½	23 7
1—1½	62	51½	¾	28 12
2—3	63	52½	1—2	34 18

LAP WELD

Extra strong, plain ends

2	55	44½	2	29	13
2½—4	59	48½	2½—4	34	20
4½—6	58	47½	4½—6	33	19
7—8	54	41½	7 and 8	31	17
9—10	47	34½	9—12	21	8
11—12	46	33½			

To large jobbers these discounts on steel pipe increased on black by 1 point and two discounts of 5 per cent; on galvanized by 1½ points with two 5 per cents. On iron pipe large jobbers obtain additional discount of 1 point with 5 and 2½ per cent on black and galvanized.

BOILER TUBES

Carload Discounts, f.o.b. Pittsburgh

Lap Welded Steel		Charcoal Iron	
2—2¼	38	1¾	8
2½—2¾	46	2—2¼	13
3	52	2½—2¾	16
3¼—3¾	54	3	17
4	57	3¼—3½	18
4½—6	46	4	20
1½	1	4½	21

On lots of a carload or more, above base discounts subject to preferential of two 5 per cent discounts on steel and 10 per cent on charcoal iron. Smaller quantities subject to following modifications from base discounts.

Lap Welded Steel—Under 10,000 pounds, 6 points under base and one 5 per cent; on 10,000 pounds to carload, 4 points under base and two 5 per cents. Charcoal iron—under 10,000 pounds, 2 points under base; on 10,000 pounds to carload, base and one 5 per cent.

STANDARD COMMERCIAL SEAMLESS BOILER TUBES

COLD DRAWN

1	61	3	46
1¼—1½	53	3¼—3½	48
1¾	37	4	51
2—2¼	32	4½, 5, 6	40
2½—2¾	40		

HOT ROLLED

2—2¼	38	3¼—3½	54
2½—2¾	46	4	57
3	52	4½, 5, 6	46

Subject to 5 per cent supplementary discount for carload lots. On less than 10,000 pounds, base discount reduced 6 points. On 10,000 pounds to carload, base discount reduced 4 points and one 5 per cent allowed. No extra for lengths up to and including 24 feet. Sizes smaller than 1 inch and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Tubing

Cold drawn; f.o.b. mill

Random lengths over 5 ft.....55%
Selected lengths, 1 to 18 ft.....53%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

Six-inch and over, Bir. $37.00 to 38.00
Four-inch, Birmingham 41.00 to 42.00
Four-inch, Chicago ..... 49.20 to 50.20
Six to 24-inch, Chicago 45.20 to 46.20
Six-inch and over, N. Y. 38.50 to 40.50
Four-inch, New York .... 41.50 to 42.50
Stand. fittings, Bir. base.... $100.00

Six to 24-inch, base; over 24-inch plus $20; 4-inch, plus $10; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe $4 higher than Class B.

Warehouse Quotations at Leading Centers, in Cents Per Pound

STEEL BARS

Baltimore	3.00c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	2.90c
Cincinnati	3.15c
Cleveland	2.85c
Detroit	3.00c
Houston	3.00c
Los. Ang.	3.40c
New York††	3.10c
Philadelphia	2.70c
Pittsburgh	2.75c
Portland	3.15c
San Frans.	3.40c
Seattle	3.15c
St. Louis	3.15c
St. Paul	3.00c
Tulsa	3.65c

IRON BARS

Baltimore	3.25c
Boston	3.265c
Buffalo	3.15c
Chattanooga	3.10c
Chicago	3.00c
Cincinnati	3.15c
Detroit	3.00c
New York††	3.10c
Philadelphia	2.70c
St. Louis	3.15c
Tulsa	3.65c

REINFOR. BARS

Baltimore	2.50c-3.31c
Boston	3.265c
Buffalo	2.95c
Chattanooga	3.10c
Cincinnati	3.15c
Cleveland	2.25c-2.44c
Detroit	3.00c
Houston	3.00c
Los Ang. cl	2.40c
Los Ang. lcl	2.70c
New York	2.65c-3.10c
Phila.	2.40c-3.00c
Pittsburgh	2.75c
San Fran. cl	2.30c
San Fran. lcl.	2.60c
Seattle	3.15c
St. Louis	3.15c
Tulsa	3.65c
Young.	2.30c-2.60c

SHAPES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland	2.95c
Detroit	3.10c
Houston	3.25c
Los. Ang.	3.40c
New York	3.10c
Philadelphia	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

PLATES

Baltimore	3.00c
Boston	3.365c
Buffalo	3.25c
Chattanooga	3.20c
Chicago	3.00c
Cincinnati	3.25c
Cleveland, ¼-in. and thicker	2.95c
Clev., 3/16-in	3.20c
Detroit	3.10c
Det., 3/16-in.	3.10c
Houston	3.00c
Los Angeles	3.40c
New York	3.30c
Philadelphia	2.60c
Pittsburgh	2.85c
Portland	3.15c
San Fran.	3.40c
Seattle	3.15c
St. Louis	3.25c
St. Paul	3.10c
Tulsa	3.75c

NO. 10 BLUE

Baltimore	3.50c
Bost. 3/16-in.	3.915c
Buffalo	3.50c
Chattanooga	3.60c
Chicago	3.35c
Cincinnati	3.45c
Cleveland	3.10c
Detroit	3.35c
Houston	3.90c
Los Ang.	3.95c
New York	3.40c
Portland	4.00c
Phila. *†	3.15c
Pitts.**	2.75c-2.85c
San Fran.	3.80c
Seattle	4.00c
St. Louis	3.45c
St. Paul	3.40c
Tulsa	3.95c

NO. 24 BLACK

Balt. *†	3.75c
Boston	4.70c
Buffalo	4.20c
Chicago	3.80c
Cincinnati	4.05c
Clev. ***	3.75c
Detroit	3.75c
Los Ang.	4.70c
New York	3.55c to 3.65c
Phila. *†	3.70c
Pitts.**	3.40c-3.50c
Portland	5.00c
San Fran.	4.35c
Seattle	5.00c
St. Louis	4.05c
St. Paul	3.545c
Tulsa	4.45c

NO. 24 GAL. SHEETS

Balt.*†	4.25c
Boston	5.45c
Buffalo	4.40c to 4.60c
Chicago (lc. del.)	4.35c
Chicago (outside shipment)	4.35c to 4.60c
Cincinnati	4.90c
Cleveland***	4.35c
Detroit	4.25c
Houston	5.40c
Los Ang.	5.10c
New York	4.25c
Phila. *†	4.25c
Pitts.**	4.00c-4.10c
Portland	5.50c
San Fran.	5.00c
Seattle	5.50c
St. Louis	4.60c
St. Paul	4.23c
Tulsa	5.35c

BANDS

Baltimore	3.50c
Boston	4.015c-5.00c
Buffalo	3.50c
Chattanooga	3.30c
Chicago	3.10c
Cincinnati	3.35c
Cleveland	3.10c
Det. 3/16-in. & lighter	3.30c
Houston	3.65c
Los Ang.	4.30c
New York	3.40c
Philadelphia	3.00c
Pittsburgh	3.10c
Portland	3.50c
San Fran.	3.75c
Seattle	4.15c
St. Paul	3.75c
Tulsa	3.85c

HOOPS

Baltimore	3.50c
Boston	5.50c-6.00c
Buffalo	3.90c
Chicago	3.65c
Cincinnati	3.90c
Cleveland	3.65c
Det. No. 14 & lighter	3.80c
New York	3.75c
Philadelphia	3.25c
Pittsburgh	4.10c
Seattle	5.15c
St. Paul	3.70c

COLD FIN. STEEL

Rounds & Hexagons

Baltimore (c)	3.30c
Boston	3.50c
Buffalo	3.15c
Chattanooga*	3.85c
Chicago	3.35c
Cincinnati	3.80c
Cleveland	3.40c
Detroit	3.65c
Los Ang. (a)	4.50c
New York	3.50c
Philadelphia*	3.40c
Pittsburgh	3.35c
Portland (a)	4.50c
San. Fran.(a)	4.25c
Seattle (a)	4.75c
St. Paul (a)	3.85c
St. Louis	3.60c
Tulsa	4.75c

Flats and squares 50c extra, except Tulsa, where 5.14c is quoted.
(a) Rounds, hex. only.

COLD ROLL. STRIP

Boston 0.100-in., 500 lb. lots	5.30c
Buffalo	5.65c
Chicago (soft) (b)	6.15c
Cincinnati	6.10c
Clev. (b)	5.95c
Detroit	5.40c
Phila. (c)	4.85c
New York	5.05c

(b) Net base, straightening, cutting, boxing 1 ton or more.
(c) Plus mill, size and quantity extras.

††Domestic bars.
*Plus quantity extras.
**Less than 25 sheets.
*†50 or more bundles.
***Less 0.15c where more than 10 bundles are ordered at once for delivery at one time

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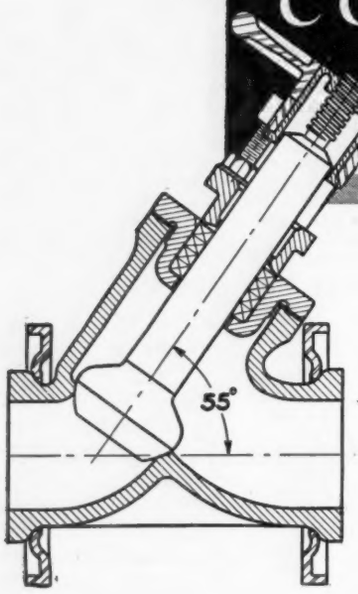

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Mill Products

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Sheets	
Yellow brass (high)	17.00
Copper, hot rolled	19.75
Lead, full sheets (cut ½c more)	9.25
Zinc sheet (100-lb. base)	9.50
Tubes and Pipes	
Seamless yellow brass (high)	21.87½
Seamless copper	22.00
Rods	
Yellow brass (high, full turnings)	15.25
Naval brass	17.37½
Anodes	
Copper, untrimmed	17.25
Wire	
Yellow brass (high)	17.50

Old Metals

Dealers' buying prices, cents lb.

Heavy Red Brass	
New York	7.25 to 7.50
Chicago	6.50 to 6.75
Cleveland	7.00 to 7.75
St. Louis	7.50 to 7.75
Heavy Yellow Brass	
New York	4.50 to 5.00
Heavy Copper and Wire	
New York	8.00 to 8.25
Boston	7.75 to 8.00
Chicago	7.50 to 8.00
Cleveland	7.50 to 7.75
St. Louis	7.50 to 7.75
Red Brass Borings	
New York	6.75 to 7.00
Yellow Brass Tubing	
Cleveland	4.50 to 5.00
Light Copper	
New York	7.00 to 7.25
Chicago	6.50 to 6.75
Cleveland	6.50 to 7.00
St. Louis	7.25 to 7.50
Light Brass	
Boston	3.50 to 3.75
Chicago	4.25 to 4.50
Cleveland	3.50 to 4.00
St. Louis	4.25 to 4.50
Zinc	
New York	2.00 to 2.25
Cleveland	1.75 to 2.00
St. Louis	2.25
Aluminum	
Clippings, soft, Cleveland	12.00 to 13.00
Clippings, hard, Cleveland	8.50 to 9.00
Borings, Cleveland	5.00 to 5.50
Cast, Cleveland	7.50 to 8.00
Cast, Boston	6.50 to 7.00
Cast, St. Louis	7.50

Secondary Metals

Remelt aluminum No. 12	14.00 to 15.00
Brass ingot, 85-5-5-5	10.25

Quicksilver Market Dull

New York—Quicksilver is dull at $113 to $114.50 a flask. Scattered quotations may be heard above and below this spread.

Metals

Copper Demand Picks Up and Prices Appear Firm—Tin Drops to Low Level—Zinc Uncertain

New York—Buying of copper has been of good size in the past week and the price now appears to be firmer than in some time. Tin prices held well for several days, but dropped to a new low level on Tuesday. Zinc is showing some price resistance to extreme quietness of demand, but the future is decidedly unsettled. Lead appears uncertain following a new decline.

Copper—Mills interests have regarded the 10-cent price as an unusual bargain, and so have bought moderately for shipment during the next few months. Ultimate consumers have been more conservative, and probably have not bought as much as the mills, though in the case of wire some fair buying has been done. Consumers have tried to buy for delivery many months ahead, but sellers have been unwilling to take such orders. While the price is a shock to producers in dropping to a level not reached since 1896, there is as yet no direct evidence in the production situation to indicate that it will be balanced against consumption in the early future. Export business, as well as domestic, has been large in the past few days, but no improvement in shipments is indicated.

Tin—Tin has been selling at the lowest level in nine years, but the previous low here was caused partly by the discount on sterling exchange so that actually the world market is lower now than at any time since 1914. Low prices brought out some consumer buying about a week ago but in the past few days the market has been quiet. The price seems to have disregarded the recent cut of more than 3000 tons in world visible supplies, but two factors help to explain this seeming paradox. In the first place, it is doubted whether the figures accurately reflect world conditions, especially as it is believed that American consumption could not possibly have been as large as September deliveries. In the next place, the trade is in doubt whether curtailment of production in the Malay States in October will be as great as in September.

Zinc—Prime western metal has eased off from 4.25c to 4.20c, East St. Louis, but business is so light that prices are nominal and it is difficult to tell what might be done on a real test demand. The concentrate market is fairly steady at $30 a ton.

Lead—American Smelting & Refining Co. has cut its price twice, recently, bringing it down from 5.50c to 5.25c, New York. This is the same as the lowest price prevailing in June and July. But the St. Louis price in dropping to 5.10c is five points lower than at the previous low point.—*Daily Metal Trade.*

Coke By-Products

Per Gallon, Producers' Plants, Tank Lots

	Spot
Pure benzol	$0.21
90 per cent benzol	0.21
Toluol	0.30
Solvent naphtha	0.25
Commercial xylol	0.25
Per Pound at Producers' Plants in 250-Pound Drums	
Phenol	0.16 to 0.17
Per Pound at Producers' Plants	
Naphthalene flakes	3.75 to 4.75
Naphthalene balls	4.75 to 5.75
Per 100 Pounds Delivered	
Sulphate of ammonia	$1.80

Naphthalene for Early 1931 Sought; Phenol Spotty

New York—Naphthalene refiners are booking a fair volume for early 1931 delivery at recently announced prices, which are unchanged. Distillates are in good demand with prices steady. Shading has practically disappeared. Output is light and there is no accumulation of stock. Benzol and toluol are in steady demand. Lacquer makers continue to take toluol and xylol in fair shipments. Phenol buying is spotty. Sulphate of ammonia prices are steadier, but volume is not large.

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin—New York Spot	Straits Tin—New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Spot Antimony	Ingot Nickel
Oct. 1	10.00	10.12½	9.87½	28.00	28.45	5.35	5.20	4.22½	22.90	7.37½	35.00
Oct. 2	10.00	10.12½	9.87½	28.00	28.45	5.35	5.20	4.22½	22.90	7.37½	35.00
Oct. 3	10.00	10.12½	9.87½	28.00	28.35	5.35	5.20	4.20	22.90	7.37½	35.00
Oct. 4	10.00	10.12½	9.87½	28.00	28.30	5.25	5.10	4.20	22.90	7.37½	35.00
Oct. 6	10.00	10.12½	9.87½	28.00	28.37½	5.25	5.10	4.20	22.90	7.37½	35.00
Oct. 7	10.00	10.12½	9.87½	27.50	27.75	5.25	5.10	4.20	22.90	7.37½	35.00

Europe

Lower Prices Forecast by Keen Competition — British Output Falls to Low Level

Birmingham, Eng.—The outlook is one of unrelieved gloom, and revival seems remote in all departments of the market. This week an old established firm in the Black Country, Alfred Hickman, a branch of Stewarts & Lloyds Ltd., has closed down a melting furnace at Bilston. A blast furnace was closed down about a month ago. These restrictions throw out of employment about 100 men. Dorman Long & Co. are putting out a blast furnace making steelworks iron at Acklam works and the Acklam steel mills are closing.

These announcements are sufficient to indicate the parlous state of the steel trade in this country. Structural engineers are booking little new business and consequently specifications for steel are scarce. The Steel association meets next month and a decision in regard to prices is awaited with interest. So far finished steel producers have declined to lower prices, holding the view that in the present conditions business would not be stimulated. But other branches of the iron and steel trade are gradually yielding to pressure, as is seen by the reduction in galvanized sheets and tin plates.

Busy on Export Cars

Midland makers of freight and passenger cars have been kept going for months past on overseas business, especially heavy orders from the Argentine. But inquiries are waning and contracts are being worked off more quickly than they can be replaced. International competition in this branch of industry is keen, especially from European firms.

Consumers of Continental steel in the Midlands have covered their requirements and many of them have withdrawn from the market. German houses are taking a firmer stand on prices of billets and will not take less than £4 15s ($23.08) delivered in the the Black Country district. French and Belgian works, however, are still eagerly pushing sales among Birmingham works. The general level of Continental prices has not changed perceptibly on the week.

The Teesside Bridge & Engineering Works Ltd., Middlesbrough, has taken part of the contract for bridge steel work required by the Union of South Africa railways, including five plate girder deck spans for the Inyezane river bridge.

Stanton Ironworks Co., Derbyshire, has been awarded a contract for 20,000 tons of cast iron segments for Tube railway developments in London. Steady demand for cast iron from Derbyshire firms has done much to keep down stocks in that district, but Northamptonshire pig iron producers are not so fortunate. Many thousands of tons of pig iron are piled at Northamptonshire furnaces and are being added to weekly, as current demand is insufficient to absorb output. The local foundries and forges have bought sufficient iron to cover immediate requirements and no amount of pressure will persuade them to enter into forward commitments.

The Central Pig Iron Producers' association held its monthly meeting yesterday. No announcement was made in regard to prices, but transactions took place on the market after the meeting at the old rates, thus indicating confirmation. Merchants and consumers consider it would be unreasonable to expect a reduction as furnacemen have already come into line with other districts in quoting prices which are in keeping with costs of production. In any case trade is not to be increased by drastic lowering of prices.

As already indicated, pig iron production is to be curtailed further on the northeast coast and with the damping down of the Dorman Long furnace only 25 plants will be in operation, as compared with 44 late in 1929. Demand on the northeast coast, however, is sufficient to absorb the small pig iron output and some reduction of stocks has been possible, though there is no prospect of more furnaces being restarted. The hematite trade is similarly situated. Stocks are being drawn upon and steadily reduced while values show a firmer tendency.

In South Wales tin plate bars have been reduced from £6 10s ($31.59) to £5 15s ($27.94), delivered, in the hope of meeting Continental competition, but foreign works are still able to quote £1 5s ($6.07) below the Welsh mills. With the downward movement in raw materials the tin plate makers have decided to pass on the benefit to consumers and this week the minimum price is 17s ($4.14) per box for tin plates, f.o.b. works port, a reduction of 1s ($0.24). Merchants had anticipated this reduction and a substantial business was done on the lower basis.

British Steel Prices May Be Reduced This Month

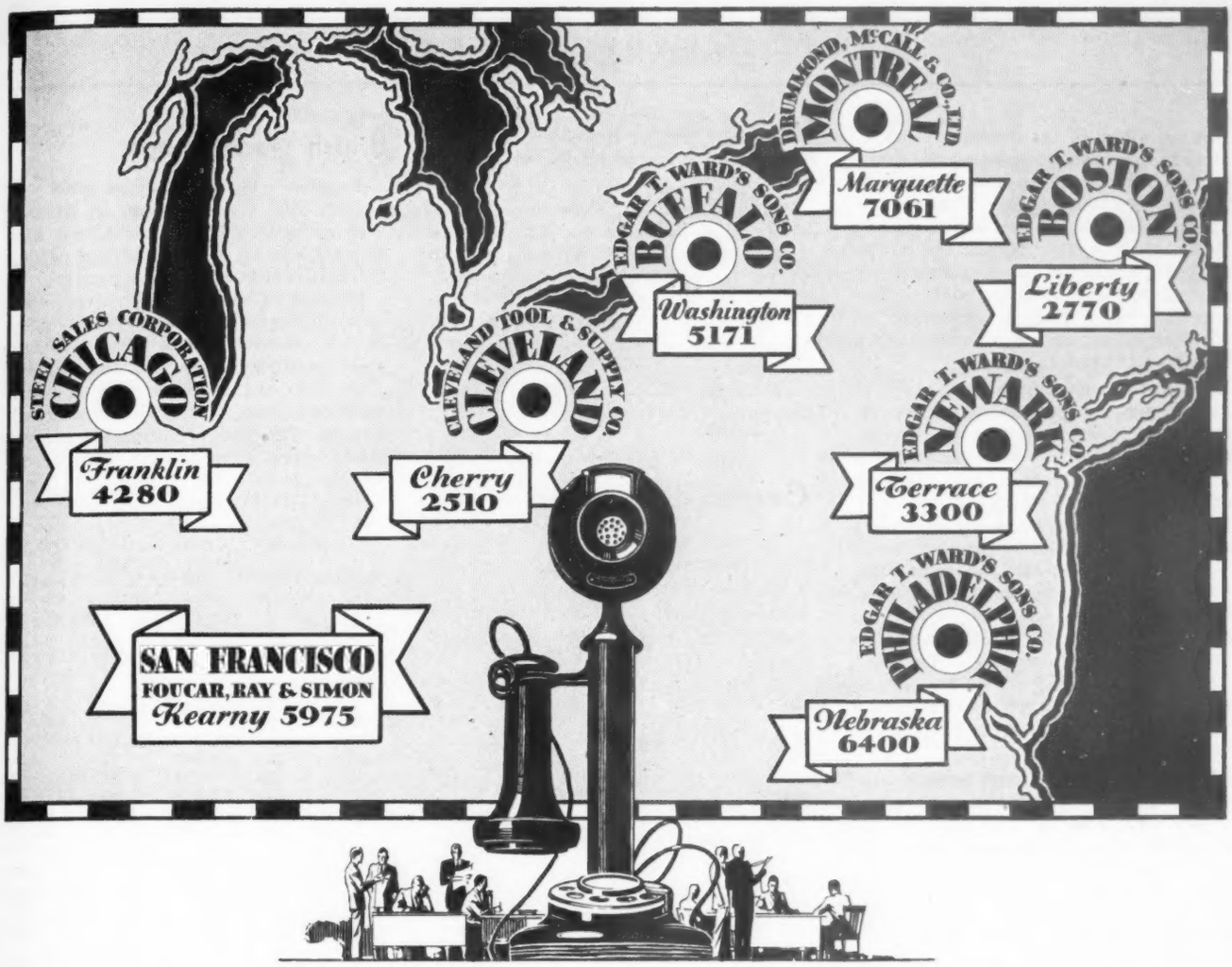
London—(*By Cable*)—Orders for pig iron have increased but still are insufficient. East coast hematite stocks are being reduced. Competition from continental furnaces is felt at Middlesbrough. Exports of pig iron from that district fell to 4897 tons in September, less than half the normal monthly shipment. Steel prices may drop by the end of October, many British plants operating on short time. Some mills in South Wales are closing, but the outlook in Scotland has improved slightly. Midland consumers are buying Continental steel. Demand for tin plate continues to decrease. Export business in galvanized sheets is dull, while domestic orders have improved.

The situation on the Continent shows no improvement. Business is quiet and prices are easy. The current report from Brussels states some mergers are being negotiated. Berlin reports better inquiry from the Far East.

German Steelmakers Must Reduce Price, Output

Berlin—The unfavorable situation of the German iron and steel market is reflected by the fact that German steelmasters produced 444,997 metric tons of rolled products in July, while only 390,200 tons were shipped, the corresponding figures for June being 402,327 tons and 371,100 tons. Thus the output, which has been reduced by more than 40 per cent compared with the middle of last year, still is in excess of shipments, so that a further reduction in mill operation will be unavoidable. In accordance with reduced sales, costs per metric ton have been increased.

Additional pressure is put on producers by the fact that, as predicted, Belgian rolled products now are imported into Germany at prices below the quotations of domestic associations; in this way merchant bars are delivered to consumers in western Germany at about 17 marks cheaper than the price at which they can be obtained from the domestic associations, but as a matter of fact, the quality of these goods is reported to be subtsantially below that of German steel. The Steel Works association, in order to compete with the cheap



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MONTREAL—Drummond, McCall & Company, Ltd.—930 Wellington Street, Telephone MARQUETTE 7061.

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PITTSBURGH—Pittsburgh Steel Products Company—Union Trust Building, Telephone ATLANTIC 4760.

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MECHANICAL TUBING

Belgian offers in the domestic market, already has been compelled to grant certain allowances to consumers purchasing German goods. This fact is officially denied, but it is understood that already a high percentage of the domestic consumption is supplied by producers below official prices. The question of a general reduction of domestic prices seems, therefore, only a matter of time.

Domestic consumption of steel is slack, and the political situation in Germany is resulting in a further reduction of activity. The railways, as previously mentioned, are placing orders with the industry totalling 272,000,000 marks af which 80,000,000 marks are for material for permanent way, 20,000,000 marks for rebuilding track, 80,000,000 marks for vehicles, 10,000,000 marks for bridges, etc. It also is intended to place orders for about 100 new locomotives. The railway order for the material for permanent way totals 50,000 metric tons a month instead of the 20,000 tons a month placed so far.

Business in the export market also is slack, and no revival is anticipated before next month. The associations expect that the market soon will reach its bottom level, as prices now have fallen to a level substantially below the last pre-war prices. Sales to the Far East suffer as a result of Japanese competition, whereas exports to British India are temporarily better. At present steelworks are busy executing an order for the Russians totaling about 1000 tons of merchant bars, 20,000 tons of sheets and 30,000 tons of pipes.

The pig iron output declined by another 4.14 per cent in August, the figure being 739,083 metric tons, or 37 per cent less than a year before. Of the 170 blast furnaces, only 74 are in operation. The arbitrator has declared binding his award according to which present wages in the Ruhr coal mines will remain effective until the end of this year.

German Exports Fall

Berlin—Exports of pig iron and steel from Germany in July showed a further drop, while imports of pig iron and ferro-alloys increased. The tonnage of scrap exported in July was 18,782 metric tons, and imports of scrap were 11,950 tons. Comparative figures follow, in metric tons:

	— Imports —		— Exports —	
Mon. ave.	Pig iron and ferro-alloys	Other iron and steel	Pig iron and ferro-alloys	Other iron and steel
1927	23,895	217,505	29,910	347,645
1928	25,535	174,250	24,585	394,575
1929	14,765	137,435	36,115	448,330
1930				
Jan.	22,004	105,127	33,153	488,245
Feb.	13,597	98,397	24,271	409,822
March	16,777	107,401	25,983	465,166
April	12,032	113,195	18,364	405,633
May	16,070	114,548	23,164	439,791
June	13,669	88,342	18,814	341,828
July	14,689	90,630	16,811	332,546

British Trade Drops

London—The tonnage of steel exported from Great Britain in August was exceptionally low, and one has to go back to the coal strike period in 1926 to meet such a low figure.

Imports of pig iron into Great Britain in August also were below those of July, and imports of other iron and steel products were 359 tons above July. Most of these imports were semi-finished steel from Belgium and France. The above figures do not include scrap. Comparative figures follow, in gross tons:

	—IMPORTS—		—EXPORTS—	
Mon. ave.	Pig iron and ferro-alloys	Other iron and steel	Pig iron and ferro-alloys	Other iron and steel
1927	50.715	316,455	27,580	322,100
1928	9,935	231,390	37,895	317,210
1929	12,310	222,410	45,430	319,520
1930				
Jan.	15,770	294,546	40,445	311,401
Feb.	24,252	235,144	26,865	267,422
Mar.	23,186	257,106	39,461	298,253
April	21,254	213,552	30,100	237,895
May	23,039	210,686	32,586	262,143
June	25,031	189,473	21,588	229,381
July	25,674	173,114	25,086	278,358
Aug.	21,931	173,473	22,026	218,828

United States, with only 7 per cent of the world's population, consumes 69 per cent of the world's crude oil, 42 per cent of pig iron, 53 per cent of tin, 47 per cent of copper, 21 per cent of sugar, 48 per cent of coffee, 36 per cent of coal, 72 per cent of silk.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, October 6	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable		£ s d		£ s d		£ s d		£ s d
PIG IRON								
Foundry No. 3, Silicon 2.50-3.00	$15.43	3 3 6*†	$12.88	2 13 0	$12.88	2 13 0	$13.37	2 15 0
Basic-bessemer	15.92	3 5 6	12.64	2 12 0	12.64	2 12 0	13.37	2 15 0
Hematite, Phosphorus 0.02-0.05	17.25	3 11 0	24.76	630*	.....	.....	17.74	3 13 0
SEMIFINISHED STEEL								
Billets	$27.95	5 15 0	$17.50	3 12 0	$17.50	3 12 0	$18.47	3 16 0
Wire rods	41.31	8 10 0	29.16	6 0 0	29.16	6 0 0	29.16	6 0 0
FINISHED STEEL								
Standard rails	$40.10	8 5 0	$31.60	6 10 0	$31.60	6 10 0	$32.08	6 12 0
Merchant bars	1.68c	7 15 0	.94c	4 5 0	.94c	4 5 0	.95c	4 6 0
Structural shapes	1.68c	7 15 0	.84c	3 16 6	.84c	.....	.92c	4 4 0
Plates, ship, bridge and tank	1.79c	8 5 0	1.10c	5 0 0	1.10c	5 0 0	1.19c	5 8 0
Sheets, black, 24 gage	2.17c	10 0 0	1.88c	8 10 6	1.88c	8 10 6	2.31c	10 10 0
Sheets, galvanized, 24 gage, corrugated	2.41c	11 2 6	2.46c	11 3 9	2.46c	11 3 9	3.13c	14 10 0
Bands and strips	2.17c	10 0 0	1.10c	5 0 0	1.10c	5 0 0	1.13c	5 2 6
Plain wire, base	2.06c	9 10 0	1.46c	6 12 6	1.46c	6 12 6	1.43c	6 10 0
Galvanized wire, base	3.04c	14 0 0	1.60c	7 5 0	1.60c	7 5 0	1.62c	7 7 6
Wire nails, base	2.39c	11 0 0	1.32c	6 0 0	1.32c	6 0 0	1.49c	6 15 0
Tin plate, base box 108 pounds	$ 4.13	0 17 0	.....	.....	.....	.....	$ 8.75	1 16 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs			Francs		Marks
Foundry No. 3 Pig Iron, Silicon 2.50-3.00	$15.43	3 3 6	$19.26	490(2)	$16.18	580	$19.76	83
Basic pig iron	15.80	3 5 0	20.63	525(1)	12.83	460	21.07	88.50
Furnace coke	3.16	0 13 0	6.60	168	5.30	190	5.12	21.50
Billets	27.95	5 15 0	22.20	565	18.13	650	27.98	117.50
Standard rails	1.79c	8 5 0	1.46c	810	1.62c	1,245	1.47c	136
Merchant bars	1.68c	7 15 0	1.18c	655	.98c	755	1.48c	137
Shapes	1.84c	8 10 0	1.26c	700	1.07c	825	1.45c	134
Plates, ship, bridge and tank	1.90c	9 0 0‡	1.46c	810	1.25c	960	1.65c	153
Sheets, black, 24 gage	2.28c	10 10 0	2.72c	1,510	2.47c	1,900	1.36c	126
Sheets, galvanized 24 gage, corrugated	2.52c	11 12 6	3.51c	1,950	2.60c	2,000	3.67c	340
Plain wire	2.06c	9 10 0	2.03c	1,125	2.15c	1,650	2.45c	227
Bands and Strips	2.17c	10 0 0	1.26c	700	1.37c	1,050	1.72c	159

*Middlesbrough; †Basic; ‡delivered; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.16) f. o. b. Ferromanganese £19 6s 0d ($93.80) delivered Atlantic seaboard, duty-paid. German ferromanganese £12 5s 0d ($59.54) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel. French, Belgian, Luxemburg, and German are for basic-bessemer steel.

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CARBOFRAX HEARTHS

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The CARBORUNDUM Company, Perth Amboy, New Jersey

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CHRISTY FIREBRICK COMPANY, ST. LOUIS, MO., KANSAS CITY, NEW ORLEANS, HOUSTON PACIFIC ABRASIVE SUPPLY CO., LOS ANGELES-SAN FRANCISCO, SEATTLE
HARRISON & COMPANY, SALT LAKE CITY, UTAH DENVER FIRECLAY CO., EL PASO, TEXAS WILLIAMS AND WILSON, LTD., MONTREAL-TORONTO, CANADA

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Machinery

CHICAGO reflects the most cheerful light of any of the manufacturing centers this week, as far as machine tool sales are concerned. That condition is in line with reports from several different quarters and checks with the spirit which was manifest during the National Metal congress and exposition. Elsewhere things do not look so good. They may not be any worse, but there certainly is no improvement, unless it be in the repair parts business. Several new models of machine tools have been announced, and other important developments are rumored. National Machine Tool Builders' association meets next week at Lenox, Mass.

New York—While inquiry for machine tool equipment shows some increase, buying is spotty. Few large lists are out, although one eastern railroad has inquired for a few tools. Sales are largely limited to one or two tools at a time. The recent improvement in small tools holds and is well spread. Little is heard from the electrical, automotive and airplane engine buyers, the latter being out of the market entirely. Most such plants are well tooled. Shipyards are active in the East and a New England yard is reported inquiring for a few tools. Several machines, including a lathe and shaper, are up for the navy department.

September with most dealers and builders showed a slight improvement over the previous month, but the gain in many instances was below expectations. A few exceptions are noted, however, one dealer reporting the best month in more than a year. Crane inquiry is up slightly. A pipe fabricating plant will place two cranes this week for installation at Hoboken, N. J.

Worcester, Mass.—The upward trend which developed in the first half of September has petered out. Grinders are showing little activity. The flurry in lathes and milling machines, which recently brought some orders from New England and the Middle West proved to be short-lived. Despite reported price readjustments in other parts of the country, New England manufacturers are maintaining their prices and no change in this policy is foreseen. Pending lists are scarce.

Pittsburgh—Machine tool inquiry is more diversified. Few inquiries call for many tools but there are indications of more general interest in new equipment. Awards remain nearly as quiet as formerly with few large lists up for closing. New inquiry from the Westinghouse Electric & Mfg. Co. is expected shortly. Tool purchase by steel companies involve more special equipment than ordinary machines. Jones & Laughlin Steel Corp. has some machinery yet to place. Railroad purchases continue light.

Cleveland—Conditions in the machine tool market remain unchanged, with a continuation of fair volume of inquiry but without encouraging orders. Whatever improvement there is appears to be in orders for repair parts, rather than for complete machines. That is better than nothing, for the reason that even the repair parts business had flattened out completely. While production schedules are being held in abeyance, there is a marked increase in engineering effort in the machine tool industry. A number of new models have just been announced and other important developments are reported to be under way. Engineering is about to assume increasing importance in selling.

Chicago—Machine tool sales remain above the volume in August and early part of September. The outlook is encouraging to most dealers. It is indicated that more important inquiries will appear late this month, and several houses are expecting a more clearly defined upturn by early November. Prospective buyers are making little or no effort to attack prices, which have remained remarkably steady throughout the business depression. Several small shop inquiries are before the market. A local steelworks has added to its purchases by closing on a bolt machine and other equipment, but probably will not act on the remainder of its inquiry for several months. Chicago board of education has 18 lathes pending for Austin high school. Fair sales of used tools are reported.

1930 Census Report Reveals Machine Tool Statistics

Bureau of the census, Washington, announces that, according to data collected in the census of manufactures taken in 1930, the total value of machine tools made in the United States in 1929 by establishments engaged primarily in the manufacture of such products amounted to $172,349,996, an increase of 60.9 per cent as compared with $107,101,652 reported for 1927, the last preceding census year. Miscellaneous products and receipts for repair work amounting to a total of $67,742,968 were also reported.

This industry embraces establishments engaged primarily in the manufacture of that class of power-driven machines generally covered by the designation "machine tools," but does not include certain types of machines designed for working metal, especially sheetmetal working machines, welding machines, wiredrawing machines, and wireworking machines.

The general statistics for 1929 and 1927 are summarized in the accompanying table, figures for 1929 being preliminary and subject to such correction as may be found necessary after further examination of the returns.

Summary of Machine Tool Industry

	1929	1927	Increase or decrease per cent
Number of establishments	272	276	— 1.4
Wage earners (average for the year, not including salaried employes)	46,924	31,985	+46.7
Wages	$75,625,004	$46,771,272	+61.7
Cost of materials, fuel, and purchased electric current	$63,652,110	$42,736,673	+48.9
Products, total value	$240,092,964	$144,496,325	+66.2
Machine tools	$172,349,996	$107,101,652	+60.9
Other products, and receipts for repair work	$67,742,968	$37,394,673	+81.2
Value added by manufactur			
Total	$176,440,852	$101,759,652	+73.4
Per wage earner	$3,760	$3,181	+18.2
Ratio (per cent) of cost of materials, containers, etc., to value of products	26.5	29.6	.....

Construction and Enterprise

CONCISE, TIMELY BUSINESS BUILDING OPPORTUNITIES IN FIELD OF INDUSTRY

New England

BRIDGEPORT, CONN.—J. L. Lucas & Son Inc., 3 Fox street, is reported to be in the market for a 17 or 22-inch planer.

BRIDGEPORT, CONN.—T. J. Pardy Construction Co., 1481 Seaview avenue, proposes to build a woodworking mill, storage building, and blacksmith shop, the latter to be 25 x 36 feet. Total estimated cost, $40,000. Plans are private.

BROOKFIELD, CONN. — Concannon Shear Co., recently organized by W. F. Concannon, Bridgeport, Conn., will manufacture scissors and shears in a plant to be erected here. Unit will be 40 x 150 feet. Initial production, scheduled for late October, will call for about 100 operatives.

NEW BRITAIN, CONN.—Eastern Malleable Iron Co. Inc., 63 John street, will award contract for a 2-story plant, to be erected at a cost of about $40,000. M. J. Unkelbach, 52 Main street, is architect.

BOSTON—Boston Terminal Co., South station, proposes to build a 2-story shop building, 100 x 600 feet. Plans are private. Estimated cost, $40,000.

BOSTON—Thompson Wire Co., 43 Mildred avenue, will construct a 1-story plant. Cost is estimated at $40,000. Contract has been awarded.

BOSTON — American International Engineering & Equipment Association Syndicate, care of J. H. Hodson, engineer, 53 State street, proposes to build a railroad and marine terminal on Mt. Vernon street, plans for which are being prepared. Nine building units and a railroad yard will be involved in the project.

NEW HAVEN, MASS.—St. Raphael hospital, 1442 Chapel street, has awarded contract to E. McKeown, 937 Dixwell avenue, for construction of a 68 x 80-foot boiler house. Approximate cost, $40,000.

PITTSFIELD, MASS.—General Electric Co., E. A. Wagner general manager of the Pittsfield Works, will construct a $1,000,000 plant for the manufacture of transformer tanks. Unit will be of welded construction, 150 x 550 feet. Construction work is to begin immediately and will be completed in about four months.

SOUTH WEYMOUTH, MASS.—Weymouth Light & Power Co., 1371 Commercial street, Weymouth, Mass., is taking bids for a 1-story substation, to cost about $40,000. E. J. Batty, 13 Temple street, Quincy, Mass., is architect.

CONCORD, N. H.—Boston & Maine railroad, East Cambridge, Mass., will improve its local shops and centralize its passenger car repair work here. Approximate cost, $400,000.

New York

ATTICA—Department of correction, state building, Albany, N. Y., will receive bids about Nov. 1 for a group of buildings for Attica state prison. A shop building and a storage building are included in the plans. Total estimated cost of the project, $1,000,000.

BROOKLYN—King County Lighting Co., 6740 Fourth avenue, proposes to build metal chemical tanks at a cost of about $50,000, at First avenue and Fifty-fifth street. T. Netz, 50 Church street, New York, has plans.

BUFFALO—Louis B. Harvey Co. has been incorporated with $20,000 capital by A. B. Towne, Dunkirk, N. Y., to deal in electrical machinery.

BUFFALO—Buffalo General Electric Co., Electric building, has plans for three substations. Total cost is estimated at $85,000.

HADLEY — Niagara Hudson River Corp., Buffalo, proposes to build a hydroelectric power plant on the Hudson river, near here.

LONG ISLAND CITY—Artcraft Iron Works Inc., 3525 Forty-first street, recently suffered damage at its plant. Company manufactures wrought iron lamps.

NEW YORK—Noma Wire Co. has been incorporated with $10,000 capital by S. B. Ackerman, 225 Broadway, to deal in electrical machinery.

NEW YORK—Rotor Plane Co. of America has been incorporated with 20,000 shares by R. H. Law Jr., 7 East Forty-second street, to deal in aircraft.

NEW YORK—Consolidated Gas Co., 4 Irving place, will build a 3-story, 100 x 100-foot repair shop at Exterior and Seventy-first streets. Plans are private. Cost is estimated at $350,000.

NEW YORK—Kree Electrolysis System has been incorporated with $50,000 and 200 common shares by A. M. Davis, 1 East Forty-fourth street, to deal in electrical machinery.

NEW YORK—Apollo Metal Ware Mfg. Co., 165 Spring street, recently suffered fire damage at its plant. Tevor F. Jones, manufacturer of brass signs, located at the same address, also suffered loss by fire.

Pennsylvania

LANCASTER — Sneed & Anderson Mfg. Co. has been incorporated with $5000 capital by William F. Sneed to

Detroit Firm Moves Into New Unit

Micromatic Hone Corp., Detroit, has moved into its new plant at Horton and Dubois streets. The present unit represents the first in a building program which is contemplated for continuation in 1931.

The firm was founded in 1927 as the Jeschke Tool Corp. and in September, 1929, was reorganized and given its present name. Kirke W. Connor is president and general manager; R. M. McGuire vice president and director of sales, Donald G. Eade secretary in charge of sales, motor reconditioning tool division, and A. J. Prentice treasurer.

A new service type cylinder hone for reconditioning passenger cars and trucks in the field is to be announced by the company within about 60 days. It will be driven by a one-half inch drill.

manufacture and sell metal and electrical products.

MARS—Liquefied Gas Appliance Co. has been incorporated with $50,000 and 50,000 no par shares by L. A. Walters, to manufacture and trade in gas appliances and devices.

NEW CASTLE—Fire recently caused $350,000 damage at the plant of Blair Strip Steel Co., G. D. Blair Jr., president. Destruction included the machine shop, eight tandem mills, annealing department, and motors. New plant unit built last year was not damaged, and operations will be resumed in about 60 days.

PHILADELPHIA — Wills Motor Co. Inc. has been incorporated with $5000 capital by Thomas A. Gangemi, 2208 East Norris street, to design, manufacture and repair engines, motors and parts.

PHILADELPHIA—Pennsylvania railroad, T. J. Skillman chief engineer, Seventeenth and Arch streets, has awarded contract to United Engineers & Constructors Inc., 112 North Broad street, for a repair shop to be built on Market street east of Thirty-second street. Cost is estimated at $30,000.

PITTSBURGH—K. Simon, 160 Fullerton street, has awarded contract to H. Dunn, 1014 Locust street, for a 2-story, 45 x 65-foot wagon shop. Estimated cost, $40,000.

PITTSBURGH—Union railroad, Carnegie building, will construct a 2000-ton automatic coaling station, storage plant and electric cinder plant at Munhall, Pa., and a coaling station, sand plant and cinder plant at Rankin, Pa. Total estimated cost, $60,000. Roberts & Schaefer, 400 North Michigan avenue, Chicago, have plans.

WASHINGTON—Board of education, R. C. Buchanan president, Wylie and Jefferson avenues, will award contract for a high school, to include a shop building, 75 x 125 feet, to be erected at Jefferson and West Hallam avenues. Estimated cost, $900,000.

New Jersey

CAMDEN—Reeve Stove Foundry, Twenty-first and Hayes streets, recently suffered damage to its plant, by fire.

GARWOOD—Standard Pneumatic Action Corp. has been incorporated with $10,000 capital by Alexander McDonnell, Flushing, N. Y., to manufacture airships and airplanes.

JERSEY CITY—North Jersey Electro-Mechanical Industries have been incorporated with 10,000 common shares by William P. Gannon, 15 Exchange place, to manufacture air pressure blowers.

MAPLEWOOD—LeRoy Schenck, 513 Valley street, has rejected bids for a 2-story shop and garage. R. B. Flatt, 600 Bloomfield avenue, Bloomfield, N. J., is architect.

NEWARK—Elias Berla has been incorporated with $100,00 capital by Furst & Furst, 60 Park place, to manufacture electrical stoves.

NEWARK—Bob-Row Auto Parts Inc. has been incorporated with $50,000 capital by Morris H. Klein, 24 Commerce street.

VENTNOR—City council will receive bids until Oct. 13 for electric pumps for proposed waterworks improvements.

Ohio

CHILLICOTHE—J. A. Morrison is in the market for air compressor bench tools and 24-inch lathe.

COLUMBUS—Ohio State Stove Corp., recently organized by M. L. Yuster, Fourth and Broad streets, proposes to put the former plant of the Ohio State Stove & Mfg. Co. into operation within about 60 days, employing 150 workers. Plant contains 60,000 square feet of floor space. Manufacture of stoves, refrigerators and steel kitchen cabinets is planned.

CLEVELAND—Interior Steel Equipment Co., recently formed by Joseph F. Schaefer, 1733 Lakefront street, has purchased a plant containing 6000 square feet of floor space, at 2359 East Sixty-seventh street. Company will manufacture metal furniture, cabinets and shelving.

DAYTON—Johnson Tool & Engineering Co. Inc. has been incorporated with 250 no par shares by Virgil Schaeffer, 855 Reibold building.

EAST PALESTINE—Adamson Mfg. Co., manufacturer of steel tanks, will receive bids soon for the construction of a 1-story plant on East Clark street. Approximate cost, $40,000.

LIMA—Neon Products Inc., Sam Kamin president, is considering expansion of its plant on West Elm street.

WICKLIFFE — Cleveland Crane & Engineering Co. has awarded contract to Austin Co., 16112 Euclid avenue, Cleveland, for a 1-story plant addition, 40 x 165 feet. Unit will be used to centralize the welding department. Work is to start immediately and will be completed about Dec. 1. Company manufactures cranes and hoists, specializing in electric welded cranes.

XENIA—State department of public works, A. T. Connar superintendent, Columbus, O., will receive bids Oct. 17 for equipment for the vocational training school building being erected at the Ohio Soldiers and Sailors orphans' home, here. Robert S. Harsh & Associates Inc., Columbus, O., is architect.

YOUNGSTOWN—Cold Metal Process Co. is reported to plan expansion of production facilities and installation of equipment.

Indiana

BUTLERVILLE—State proposes to build a power house here at the state farm for feeble minded. Orlando B. Little, 307 North Illinois street, Indianapolis, is architect. Estimated cost, $50,000.

FT. WAYNE—Fries Tool & Machine Co., 1918 East Wayne street, will receive bids about Nov. 1 for a plant addition. G. Mahurin, 425 Standard building, is architect. Cost is estimated at about $40,000.

MARION—Precision Devices Inc. has been incorporated with 2000 no par shares by H. E. Blasingham and John R. Browne, to manufacture and distribute mechanical devices, tools and machinery.

Michigan

BENTON HARBOR—Benton Harbor Malleable Industries will build a new foundry unit, 90 x 250 feet. Contract has been awarded to Max W. Stock Construction Co., St. Joseph, Mich.

DETROIT—Birtch Controls Inc. has been incorporated with $10,000 and 1000 no par shares by Frank B. Marble, 1311 Terminal avenue, to manufacture and deal in gas regulators, burners and appliances.

DETROIT—MacRae Western Inc., 1501 Beard avenue, has been incorporated with $25,000 capital by Keith MacRae, to manufacture and deal in automobiles, tractors, aircraft and machinery.

DETROIT—Curtis, Layle & Co., 2842 West Grand boulevard, has been incorporated with $10,000 capital by Herbert F. Layle to manufacture and deal in fire extinguisher equipment, building equipment, and appliances.

DETROIT—B. & L. Compression Spark Plug Co. has been incorporated with $25,000 capital by James R. Gray, 9020 Bryden street, to operate a general machine shop and to manufacture and sell spark plugs and parts.

DETROIT—U. S. Tool & Mfg. Co., whose incorporation recently was noted, has awarded a contract to Austin Co., 16112 Euclid avenue, Cleveland, for the design and construction of a new plant on Kingsley street, for the manufacture of precision tools. Unit will be one and 2-story, 100 x 200 feet. (Noted Oct. 2.)

DETROIT—Ex-Cell-O Aircraft & Tool Corp., 5835 Martin avenue, has awarded contract to Austin Co., 16112 Euclid avenue, Cleveland, for the design and construction of a new unit for its Continental Tool division. New building will be 1-story, 53 x 190 feet, and will cost about $150,000.

HOLLAND—Holland Furnace Co. has awarded contract for a 3-story unit to house its service department and offices. Building will be 40 x 200 feet and will cost approximately $250,000.

PORT HURON—Midland Wire Co., Moak and Twenty-fifth streets, has been incorporated with $100,000 capital by Stanly W. MacFarland, to manufacture and deal in wire.

Illinois

ALTON—H. C. Blaske is inquiring for a gasoline or electric single-drum hoist.

CHICAGO—Turbine Mfg. Co., 120 North Carpenter street, has been incorporated with $5000 capital by Lee D. Mathias, Majestic building, to deal in water heaters.

CHICAGO—Wilson Mfg. Co., 1223 Victor avenue, has been incorporated with

$15,000 capital by Fairweather & Guggsell, 231 South LaSalle street, to deal in vending machines.

CHICAGO — Clawson & Bals, 4701 Lake street, motor parts manufacturers, have awarded contract to Webster Construction Co., 520 North Michigan avenue, for a 1-story plant addition, 50 x 76 feet. Approximate cost, $6900. R. W. Stott, 1558 West Seventy-ninth street, is architect.

Southern States

SOUTH JACKSONVILLE, FLA. — City will improve airport and construct a hangar and administration building. Marcel Mazeau, 314 Colomso street, is preparing drawings. Facilities for seaplanes are planned.

BATON ROUGE, LA.—Baton Rouge Electric Works will build a plant, 85 x 150 feet, to include an armature repair department.

MARRERO, LA. — East Jefferson waterworks district will receive bids until Oct. 30 for pumping equipment.

BALTIMORE—Standard Oil Co. of New Jersey, 26 Broadway, New York, plans to build a power house at 3505 Boston street. Building will be 49 x 72 feet and will cost approximately $30,000.

BALTIMORE—Arundel Corp., Pier 2, Pratt street, recently noted as having sustained fire loss at its machine shop, will rebuild. Contract has been awarded to M. A. Long Co., 10 West Chase street. Building, to be 50 x 400 feet, will be built at 2100 Frankfurst avenue. Approximate cost, $25,000. (Noted Aug. 21.)

KINSTON, N. C.—City receives bids Oct. 14 for power plant unit. W. C. Olsen, 5 Exchange place, Raleigh, N. C., is engineer.

COLUMBIA, S. C.—State highway department has awarded contracts for maintenance shops in Clarendon, Saluda, Calhoun and Georgetown counties.

McKENZIE, TENN.—City plans to improve and extend its municipal power plant, and add new equipment.

NORFOLK, VA.—Norfolk & Western railway, W. P. Wiltsee chief engineer, Roanoke, Va., will add 162,00 square feet of floor space to its warehouse facilities here by means of additions to warehouses D and F. Estimated cost, $250,000.

QUANTICO, VA.—Navy department, bureau of yards and docks, Washington, receives bids Oct. 8 for a 60 x 110-foot hangar extension and for dismantling and re-erecting three hangars, each 66 x 140 feet.

CLARKSBURG, W. VA.—Weirton Steel Co., Weirton, W. Va., John C. Williams president, will electrify its tin plate plant here at a cost of about $250,000. A boiler explosion, recently noted, wrecked a plant unit and caused temporary suspension of operations. (Noted Aug. 14.)

Missouri

ST. LOUIS — Panyard Piston Ring Co. has been incorporated by E. C. NaDal, 1020 Art Hill.

THAYER—City proposes to construct a power plant. W. A. Fuller Co., 2916 Shenandoah avenue, St. Louis, is engineer.

Arkansas

EL DORADO—Arkansas Power & Light Co., C. J. Griffith vice president and general manager, Little Rock, Ark., will double the capacity of its power station here. Four transformers and auxiliary equipment will be purchased at a cost of about $65,000.

Oklahoma

OKLAHOMA CITY—City, recently noted as planning development of a 640-acre airport, plans to erect a machine shop for engine repair. F. M. Fry is city manager. (Noted Oct. 2.)

OKLAHOMA CITY—Indian Territory Oil Co., care of P. J. Wines, box 1537, is completing an oil field machine shop in the South Oklahoma City field, 40 x 120 feet, for manufacture and repair of oil field equipment.

OTTAWA—W.K.H. Mining Co. has been incorporated with $20,000 capital by W. L. Wagnon, 2511 Main street, Joplin, Mo., to engage in lead and zinc mining.

TULSA—Burt Corp., 320 East Eleventh street, proposes to erect a plant for the manufacture of oil field specialties. Plans are indefinite.

Texas

CLEBURNE—Gulf, Colorado & Santa Fe railroad, F. Merritt chief engineer, Galveston, Tex., in carrying out extensive building program in this area, will award contract for shops to be located here. F. G. Pettibone, Austin, Tex., is general manager in charge.

EDINBURG — Hidalgo county water improvement district No. 6 will receive bids until Oct. 15 for three pumps and other equipment for a proposed irrigation project. Total expenditure will amount to about $300,000.

FT. WORTH—A. Z. Boiler & Tank Co. has been incorporated with $10,000 capital by W. A. Atherton, 700 East Front street, to manufacture boilers and tanks.

FT. WORTH—City, O. E. Carr manager, will build a repair shop at Meachum airport, to be leased to Texas Aero Corp. Plans are being prepared by the city engineering department for a unit 78 x 165 feet. C. M. Thelin is chief engineer.

HOUSTON—Reliable Meter Co. has been incorporated with $25,000 capital by R. E. Davis, 4206 Garrow street.

LULING — Tullos Iron Works has been incorporated with $20,000 capital by E. E. Tullos, to design and deal in metal products.

PERRYTON—City, C. E. Forbes mayor, proposes to develop an airport on a 160-acre site now under consideration.

SAN ANTONIO—Maj. A. W. Robins, commanding officer, Duncan field, has plans for hangar units costing approximately $100,000, and for depot shop buildings costing $400,000.

TEMPLE—Texas Pacific Coal & Oil Co., Ft. Worth National Bank building, Ft. Worth, Tex., proposes to build an oil refinery here at a cost of $500,000. A machine shop and power plant are included in the plans. Harris Pruitt is chief engineer in charge.

Wisconsin

GRANTSBURG—H. F. Brown is investigating possibility of a municipally owned light plant, estimated to cost about $60,000.

OSHKOSH—Frank Kriz Co., manufacturer of window and door screens, has applied to city authorities for revision of building ordinance to permit construction of a plant between Twenty-second and Twenty-third streets.

RHINELANDER—Plant of Rhinelander Iron Co. recently was damaged by fire. Principal damage was in the molding furnace room.

Minnesota

THIEF RIVER FALLS—City will expand the municipal power plant. Bond issue for $80,000 has been approved and will be available.

North Dakota

WESTHOPE—Central West Public Service Co. will build a new power plant here and will install a new engine.

Iowa

MT. PLEASANT — State highway commission, Des Moines, Iowa, will build a storage building and machine shop at Henry and Pine streets. Unit will be 34 x 96 feet, and will cost about $6000. William Eberts is local highway maintenance engineer.

VINTON—Unnamed interests are reported to propose establishment of a plant here to manufacture machinery. Local organization for industrial promotion is the Greater Vinton club.

Colorado

DENVER—Public Service Co. of Colorado plans to build a substation on Irving street. Estimated cost, $40,000.

DENVER—General Electric Broadcasting Co. proposes to build a 50,000-watt radio transmitting station at a cost of $250,000.

Montana

MILES CITY—City council proposes to construct a hangar unit, 60 x 90 feet,

at the municipal airport. Cost is estimated at $4000.

Pacific Coast

AGNEW, CALIF.—Department of public works, G. B. McDougall state architect, Sacramento, Calif., is preparing plans for a group of buildings to be erected here for the state hospital. A power house is included. Cost of the entire project, $350,000.

BAKERSFIELD, CALIF.—San Joaquin Light & Power Corp., Power building, Fresno, Calif., has awarded contract to C. Gramlin, Bakersfield, for a 1-story, 35 x 80-foot meter shop.

LOS ANGELES—Los Angeles school district has awarded contract for school buildings, including a shop. Total estimated cost, $340,000.

LOS ANGELES—Western Automatic Sprinkler Co., 204 North Los Angeles street, will build a shop building on East Twelfth street, near Soto street.

OAKLAND, CALIF.—Hoyt Heater Co. East Tenth and High streets, has awarded contract for the construction of a 1-story shop building. Cost is estimated at $15,000. Company manufactures water heaters.

OAKLAND, CALIF.—Contractors Machinery Exchange, 1135 Fifty-seventh avenue, owned by Edward R. Bacon Co., Seventeenth and Folsom streets, has awarded contract for the design and construction of a new display and storage building to Austin Co., 16112 Euclid avenue, Cleveland. Building is to be 100 x 120 feet, and will cost $300,000. Construction is to be completed in about two months.

PASADENA, CALIF.—City will readvertise for bids on a crane and hoist, electrically operated, for the municipal light department.

SOUTH SAN FRANCISCO, CALIF.—Plant of the Western Pipe & Steel Co., Butter road, recently was damaged by fire. Estimated loss, $2000.

CORVALLIS, OREG.—City council proposes to improve facilities at the municipal airport. Among items is the construction of hangar units at a cost of about $13,000.

SNOHOMISH, WASH.—Puget Sound Power & Light Co., Seattle, will build a power substation here. Approximate cost, $40,000.

Dominion of Canada

CHATHAM, ONT.—Chatham Motors Ltd. has been incorporated with $75,000 and 500 no par shares by James A. McNiven and William G. Kerr to manufacture and deal in merchandise.

KIRKLAND LAKE, ONT.—Wright Hargreaves Mines Ltd. will build additions to its gold mining plant and add equipment, including air compressors. Plans are private. Cost is estimated at $150,000.

PORT COLBORNE, ONT.—Port Colborne Iron Works is reported to be considering construction of a new plant, and the eventual construction of a floating drydock.

TORONTO, ONT.—Projects now under way on provincial improvements, through the department of public works, Parliament building, include two new vocational schools costing $6,300,000, industrial school at New Toronto, Ont., costing $770,000, and replacement of an industrial school at Mimico, Ont., with an expenditure of $1,000,000.

New Trade Publications

IRON CASTINGS—A particularly difficult casting produced in its high-tensile cast iron is the subject of a leaflet by the Commercial Steel Casting Co., Marion, O.

DIE CASTINGS—Aluminum Co. of America, Pittsburgh, discusses die castings in a new booklet and illustrates a wide variety of uses to which the castings are applicable.

SCREW MACHINES—Davenport Machine Tool Co., Rochester, N. Y., has issued a catalog of its multiple spindle screw machines. Illustrations show details of various parts and operation is fully described.

ALLOY CASTINGS—Ohio Steel Foundry Co., Springfield, O., has issued a bulletin on its heat-resisting alloy for steel castings. The alloy is described and illustrations show a wide variety of uses to which it has been put in industrial work.

SHEET STEEL GRADES—A booklet covering its grades of electrical sheet steel has been issued by the American Rolling Mill Co., Middletown, O. It is designed to aid buyers of these sheets to choose those best suited to their needs.

ELECTRIC MOTOR—A bulletin by the Allis-Chalmers Mfg. Co., Norwood, O., describes its totally enclosed fan-cooled motor for use where dust, fumes, moisture and other destructive agents are present. Details of construction are illustrated.

OVENS—Continuous conveyor ovens of elevated and tunnel types for various baking and drying purposes are featured in a bulletin by the Despatch Oven Co., Minneapolis, which shows uses to which they have been put.

CANADIAN TRADE DIRECTORY—A directory of Canadian and foreign firms represented in Canada, in its twelfth annual edition, has been issued by the Fraser Publishing Co., Montreal. It is devoted to the Canadian automotive, electrical, hardware, radio, machinery and allied industries.

ELECTRICAL EQUIPMENT—General Electric Co., Schenectady, N. Y., has issued several bulletins on various equipment, including: Quartz-rod thermostat; squirrel-cage induction motor; crane equipment; fractional motors; direct current crane and hoist motors; synchronous motors;

METAL HEATER—Savings in heat by the use of electric devices is illustrated in a circular by the American Car & Foundry Co., New York, in which is described the Berwick electrical metal heater. Illustrations show various types of these heaters and data tables give much information.

CRANES—Bedford Foundry & Machine Co. Inc., Bedford, Ind., believes production may be increased and materials may be handled much more cheaply by use of its cranes in a variety of ways in industry. A current bulletin illustrated means by which this may be accomplished.

PYROMETERS—A catalog covering its indicating, recording and automatic control pyrometers has been issued by the Brown Instrument Co., Philadelphia. It contains a resume of the theory and practice of applied pyrometry, with descriptions and illustrations of instruments, thermocouples, protecting tubes and other equipment.

DIVIDING MACHINES—R. Y. Ferner Co., Washington, agent for the Societe Genevoise, Geneva, Switzerland, has issued a catalog covering the latter's high precision linear and circular dividing machines for laboratories and works. It covers the redesign of its dividing machines as carried out for several years and shows the latest features incorporated in them.

TURRET LATHES—Landis Machine Co. Inc., Waynesboro, Pa., manufacturer of thread cutting machinery and die heads, features in current bulletin its type of head for application to turret lathes. It describes the head, with taper attachment, internal mechanism, hand-opening attachment and sliding adapter. It is well illustrated and full specifications are given.

WELDING WIRE—A handbook for welders has been issued by the American Steel & Wire Co., a subsidiary of the United States Steel Corp., Cleveland and Chicago. The science of welding and use of proper rods form part of the discussion and products of the company for the purpose are described. American Welding society specifications for electrodes and welding rods are included.